SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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R. HUDSON'S

Patent Steel Trucks, Points and Crossings,

PORTABLE RAILWAY, STEEL BUCKETS, &c., &c.

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In connection with the Leeds Exchange, and all the principal Hotels and places of business in the town.

GILDERSOME FOUNDRY, NEAR LEEDS.

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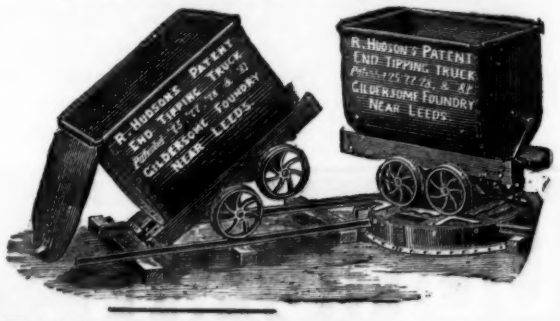
UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the LIGHTEST, STRONGEST, and most CAPACIOUS made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

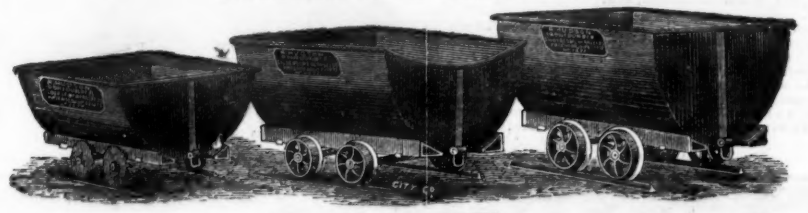
Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.
N.B:—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

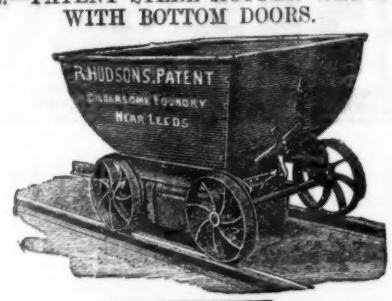
1.—PATENT STEEL END TIP WAGONS.



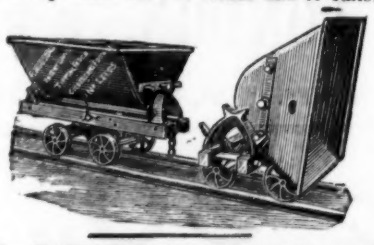
7.—PATENT STEEL MINING WAGONS.



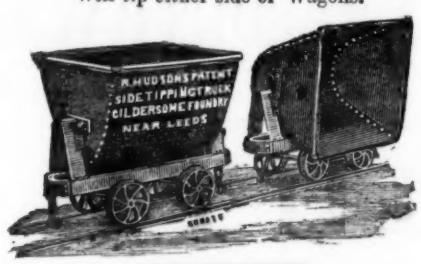
12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.



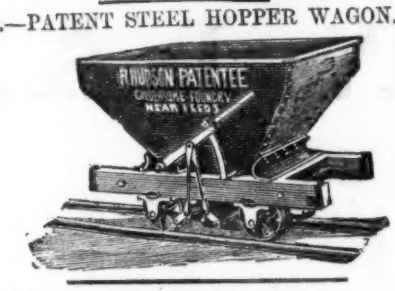
2. PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK,
Will tip either SIDE or either END of rails.



8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS,
Will tip either side of Wagons.

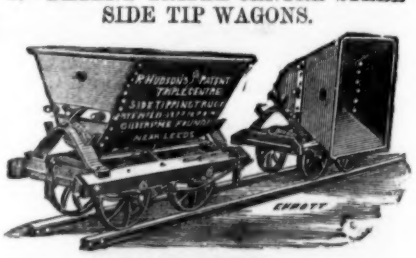


13.—PATENT STEEL HOPPER WAGON.

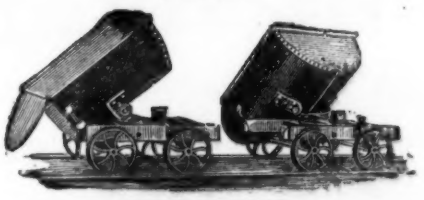


ONE man can EASILY tip ANY WEIGHT in these wagons.

3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.

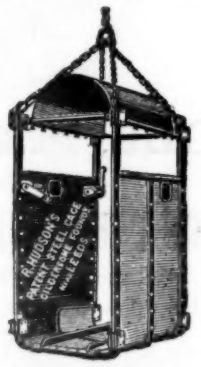


9.—PATENT STEEL ALL-ROUND TIP WAGON.



14.—SELF-RIGHTING STEEL TIP BUCKET.
(The "CATCH" can also be made SELF ACTING if desired.)

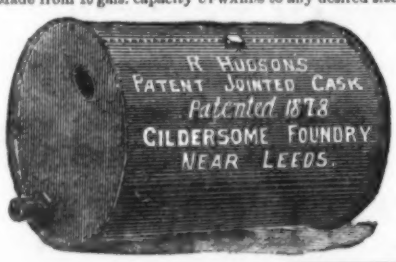
15.—STEEL CAGE.



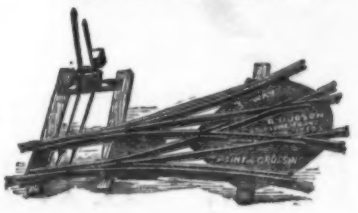
4. PATENT STEEL PLATFORM OR SUGAR CANE WAGON.

10.—LEFT-HAND STEEL POINT AND CROSSING.

5.—PATENT STEEL CASK.
As supplied to H.M. War Office for the late war in Egypt).
DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight.
(Made from 10 gals. capacity UPWARDS to any desired size.)



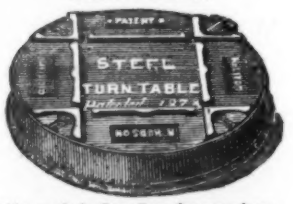
11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.



16.—PATENT STEEL WHEELBARROWS.
Made to any Size.
Lightest and Strongest in the Market.

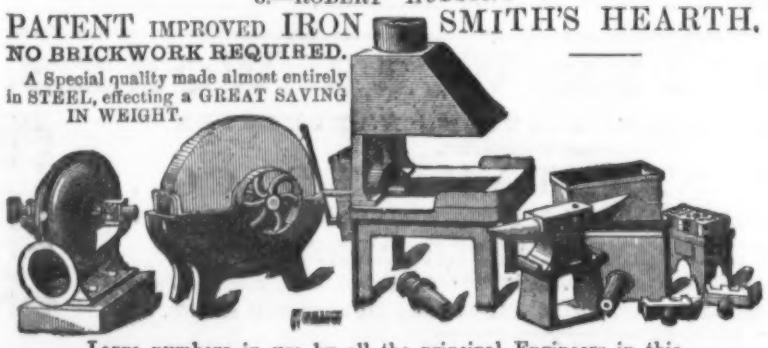
A great success.

17.—STEEL SELF-CONTAINED TURNTABLE.



(Also made in CAST Iron for use where weight is not a consideration.

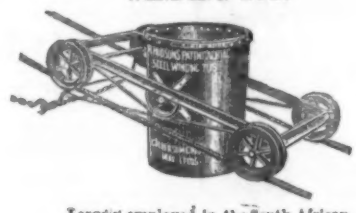
6.—ROBERT HUDSON'S
PATENT IMPROVED IRON SMITH'S HEARTH.
NO BRICKWORK REQUIRED.
A Special quality made almost entirely in STEEL, effecting a GREAT SAVING IN WEIGHT.



Large numbers in use by all the principal Engineers in this country and abroad.

No. 19.—PATENT STEEL CHARGING BARROW,
DOUBLE the STRENGTH & much LIGHTER than ordinary Barrows

18.—"AERIAL" STEEL WINDING TUB.



Largely employed in the South African Diamond Fields.

ALL KINDS OF BOLTS NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES

BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING, for High Pressure Engines. This Packing has been specially designed to overcome the difficulties experienced by engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the construction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realised unless the Packings are so constructed as to avoid stoppages for the purpose of re-packing the stuffing boxes. It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. This Packing has met with the most unqualified approval wherever it has been used, and on being taken out after about twelve months, working at 70 lb. pressure, it has been found to be in a perfect state of preservation, and was therefore replaced. The Patent Block Packing is square, as Fig. 1, and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with rubber inlaid. An Engineer writes as follows:—"The Asbestos Block Packing works splendidly. I have never seen its equal. We keep our gland nuts so that you can move them with finger and thumb, and can maintain a constant vacuum of 28½ in." As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, users are requested to see that the packing supplied to them bears my trade mark.

The goods of this house are of the highest quality only, and no attempt is made to compete with other manufacturers by the supply of inferior materials at low prices. All orders must be sent direct to the undermentioned depôts and not through Agents or Factors.

BELL'S ASBESTOS BOILER PRESERVATIVE. This useful mixture by absorbing the free oxygen that is in the water entirely checks pitting and corrosion. It also disintegrates incrustation so immediately as to prevent its adhering to the plates. Not only is a great economy of fuel effected by keeping boilers clean, but the risk of having the plates burned is thereby obviated. It has been computed that 1/16 in. thick of incrustation causes a waste of 15 per cent. of coal; ¼ in., 60 per cent.; ½ in., 150 per cent. Thus the Preservative avoids the great risks which are inseparable from scaled plates, lengthens the life of a boiler, and covers its own cost a hundred-fold by economy of fuel. It is entirely harmless, and has no injurious action on metals. It can be put into the feed tank or boiler, as may be most convenient. Sold in drums and casks bearing the Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING

for Locomotives, and all Stationary Engines running at very high speed with intense friction.

The following Testimonial refers to this Packing:—

Festiniog Railway, Locomotive Superintendent's Office,
Portmadoc, January 13, 1883.

Mr. John Bell, 113, Southwark-street, S.E.

DEAR SIR,

I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed, better than we expected. We have a locomotive packed with it, which has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting Packing. The Asbestos Yarn we find is very useful, and answers admirably. Yours truly,

(Signed) W. WILLIAMS.

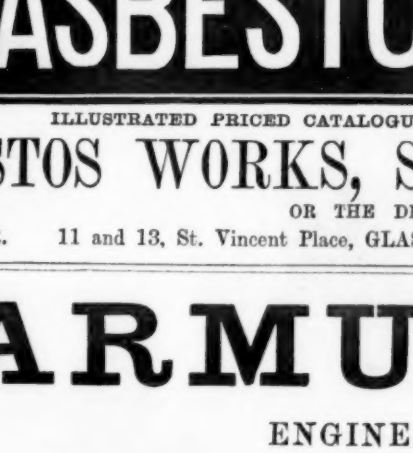


FIG. 5.

FIG. 6.

FIG. 1.

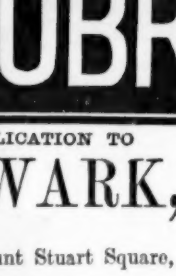


FIG. 2.

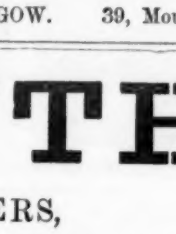


FIG. 4.

FIG. 3.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors; also for large "still" joints where boiling fat and steam have to be resisted. It is kept in stock in rolls of 100 ft., from ⅛ in. (Fig. 5) to 3 in. wide, and any thickness from 1/16 in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary. The same material is made up into sheets about 40 in. square, and each sheet bears the Trade Mark, without which none is genuine. It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with these inferior articles at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears the Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-64th in. to 1 in., and ½ millimetre to 25 millimetres thick. Each sheet bears the Trade Mark.

BELL'S ASBESTOS EXPANSION SHEETING (PATENT).

This Sheeting is another combination of Asbestos with India-rubber, giving to the steam user the special advantages of both materials.

The India-rubber Washer is protected from the action of heat and grease by an outer coating of vulcanised Asbestos Cloth, thus producing an excellent joint where expansion and contraction render other materials unserviceable.

This material is admirably suited to steam pipe joints and every class of valve.

Valves made of this material are very durable, as they are not subject to injury by oil.

BELL'S "ASBESTOS LUBRICANT."

ILLUSTRATED PRICED CATALOGUE FREE ON APPLICATION TO

BELL'S ASBESTOS WORKS, SOUTHWARK, LONDON, S. E.

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T. LARMUTH & CO.,

ENGINEERS,

MANCHESTER, ENGLAND.

MINING INSTITUTE OF CORNWALL
D. McCulloch
FIRST CLASS.
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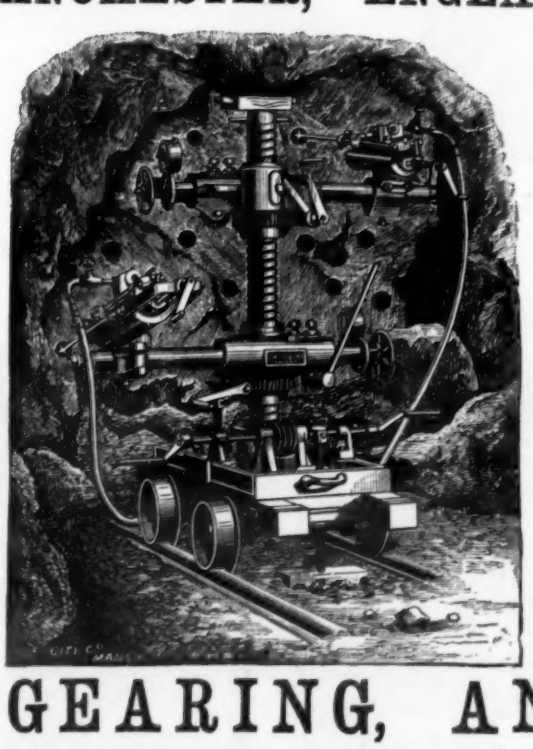

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SPECIALITIES FOR

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FROISETH'S NEW AND REVISED MAP FOR 1875,—Size 40 by 56 inches, scale 8 miles to the inch. Handsomely engraved, coloured in counties, showing the Towns, Settlements, Rivers, Lakes, Railroads Mining Districts, &c., throughout the Territory, and all the Government Surveys to date. Mounted on cloth, £2; half-mounted, £1 12s.; pocket form, £1.

Also, GENERAL MINING MAP OF UTAH, showing twenty-eight of the principal Mining Districts adjacent to Salt Lake City, and location of the most prominent mines. Price, pocket form, 6s.

Also, NEW MAP OF LITTLE AND BIG COTTONWOOD MINING DISTRICTS showing the location of over Four Hundred Mines and Tunnel Sites, together with the Mines Surveyed for United States Patent. Price, sheets, 6s.; pocket form, 8s.

For sale, and supplied by—

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B. A. M. FROISETH, Salt Lake City, Utah, U.S.

MR. P. S. HAMILTON (late Chief Commissioner of Mines for the Province of Nova Scotia), PRACTICAL GEOLOGIST, MINING AGENT, and MINING ENGINEER, HALIFAX, NOVA SCOTIA.

PURCHASES and SALES of MINING PROPERTY effected, with careful regard to the interests of clients.

MANCHESTER WIRE WORKS.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

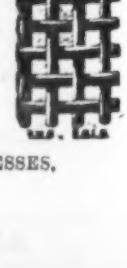
JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.



PERFORATED IRON, STEEL, COPPER, AND ZINC PLATES IN VARIOUS DIMENSIONS AND THICKNESSES.

Shipping Orders Executed with the Greatest Dispatch

Original Correspondence.

GOLD MINING, AND ITS MANAGEMENT—No. X.

SIR,—The wretched fiasco, under the name of gold mining, that has been carried on in India and the Gold Coast of Africa, with results only to be expected from the system of management that was adopted, seems not improbable as likely to be imitated in the Transvaal. It is a well-known fact that in India, when the companies had been formed here with such extravagant notions of success, based on the most meagre and mythical prospects, that the supposition appeared to be that it was only to rush out a lot of machinery, regardless of type, pattern, or utility, to be erected and worked by amateurs, and success would be ensured. It never appeared to dawn upon the intelligence or common-sense of the gentlemen who undertook what appeared to be so easy a task—the direction of gold mines—that it would be most prudent to prospect, develope, and prove a mine to some extent before putting up a lot of expensive and useless machinery that may never be wanted.

Profitable gold mining in America and Australia is not conducted nor arrived at by such methods. Where practical men are entrusted with the management of gold mines they usually prospect and develope the mines to such an extent as justifies the erection of machinery, and not put up the machinery first and prospect the mine afterwards, when the capital is exhausted. The South African or Transvaal gold fields have, by some enthusiasts, been compared with, and stated to be likely to eclipse, the Californian and Australian gold fields in their best days. I scarcely think those who make the statements can have worked on, or have been associated in, the development of those rich gold fields, or they would never have made such wild statements.

The Transvaal gold fields have now been discovered some eight or nine years, in a healthy climate, with an abundance of cheap labour and water at command, and yet all we hear of the output of gold is some 300,000 or 400,000 ozs. of gold, or about the yield of one good mine in Australia or America.

It appears from the reports that 80 ft. is the greatest depth attained, and most of the estimates are based on 10 to 18 ft., simply open-cuts. Alluvial deposits are placed at from 3 to 40 ft. in depth. In California and in Australia mines at such trivial depths would only be considered as a prospect, and would bring only prospect prices—say a few hundred pounds or a few thousand dollars. Then, again, a few feet of gravel does not admit of, or is not suitable for, hydraulic mining, and a bank of 40 ft. must be very rich to pay. The gravel banks or deposits in California, that are worked so profitably usually run from 70 ft. to upwards of 400 ft. in thickness, and it is by being able to play the jets of water on such deep faces of dirt that hydraulic mining has paid so well.

It, therefore, becomes a question as to whether hydraulic mining will be the most suitable for the Transvaal, and if the attempt is made whether it will not be short-lived. I think there are other modes of treating the alluvial deposits in the Transvaal that would be more practical, and give quicker and better returns if they will yield anything approaching to what has been stated.

It seems to me somewhat preposterous to compare the prospects of the Transvaal with those of Australia and California with the small amount of development done, and gold obtained during such a long time. In Victoria during the first 10 years about 100,000,000*l.* sterling was produced, as also a similar amount from California, and some of the small gold fields turned out more gold annually than the Transvaal has turned out altogether, and all the development work done on all the fields would scarcely amount to that of one or two mines in Australia or America.

A number of authorities have been out to examine and report on the districts, and others, who claim to have resided on the gold fields, report, and are prepared to report, on the enormous wealth said to be lying about on or close to the surface, and only awaiting English capital for development. It does appear to me very strange that where gold is so plentiful (as is stated to be), and no difficulty existing as regards water, labour, and means of living, that there has not been more gold actually produced by manual labour, and the primitive but effective means that practical miners could adopt under such circumstances With such prospects as reported men of energy and experience should have had hundreds or thousands of natives at work with ground and box sluices, long toms, cradles, and horse puddling machines, and with such appliances the labour of every man, if properly directed, would average from one to two ounces of gold weekly, or, if the reports can be relied on, a great deal more. But where water-power can be obtained, as stated in many places in the Transvaal, the expense of working puddling machines, washing cylinders, or batteries of stampers, becomes reduced to a minimum, and they can be erected quickly and worked with profit on low grade ores.

The idea of forming companies with such large capitals to work shallow alluvial ground, stated to be so enormously rich, and quartz veins cropping out from the surface of almost unparalleled quality appears to me the height of absurdity. A few companies are already registered, with capitals amounting to 7,000,000*l.* or 8,000,000*l.* sterling, some of which are so overloaded with paid-up shares as against the contributing that the possibility of their ever paying is indeed remote. A company with a working capital of from 25,000*l.* to 100,000*l.* ought to be ample to thoroughly develope and bring into dividends any of the mining properties that I have seen reported on, and with a fair amount of practical work, under economical management, should pay at least from 25 to 100 per cent. on such a capital; but if the profits from such a mine have to be divided into 400,000 or 500,000 shares, and subjected to an expensive ornamental management, the profits to be divided will be insignificantly small.

Had there been as much practical business capacity displayed in opening up and developing the mining properties in the Transvaal as there has been ingenuity in raising huge capitals in imagination, which will always be a clog upon the enterprises, there would have been some hope that the investors of money in gold mining in the Transvaal would have been well paid. There is a peculiar vagueness in the description of some of the mining properties, as being contiguous to where gold has been found, that bears as much affinity of its real value as the fact of a man living next door to a bank may be supposed to be wealthy. It is surprising that with the Indian and West African experiences so fresh upon their memories, and so indelibly impressed in the pockets of those who were gulled by such fallacious promises on paper of improbable results that it would be found possible to foist on the public mining properties with so little development at such extravagant premiums.

The experiment to hydraulic a mine has already met with a miserable failure in West Africa, where an amateur authority on gold mining was going to perform great wonders with a little engine and a "squirt," by washing the hills into the valleys, and extracting the gold lying about in such profusion, by some novel process; but the performance has not yet come off—the engine would not work, the "squirt" would not act, the water would not run uphill, the gravel and clay would not dissassociate itself from the gold to enable the amateur manager to pick it up in handfulls, the shareholders got dissatisfied and would not furnish any more "planks or money;" so the wonderful new process of hydraulicing, which was to produce such fabulous results and make the name of the introducer famous in mining history, has ended in a miserable fiasco, and may for the future be termed with other new chum or amateur methods of gold mining a system of high frolicking with shareholders' money.

Before companies send out large plants of machinery for washing and crushing operations they should be well assured that the mines are so far developed as to be able to keep the mills supplied with payable ore. When people talk of putting up 60 head of stampers for quartz crushing they must understand that it will take something like 100 tons of stone per day to keep the mill employed, and supposing they have a fair sized lode to work on, cropping out of the surface, it would take probably two years, under favourable circumstances, to develope sufficiently to enable a 60-stamp mill to be kept in full work. The crushing of 100 tons per day means 30,000 tons a year, and before 60 head of stampers are erected there ought to be several years work in sight, besides a good prospect of a continuance as a permanency.

The purchase and erection of costly plants of machinery and appliances on the anticipations that dividends can be made before the mines are opened up, or fairly prospected, is only calculated to mislead and disappoint anxious shareholders who invest their money on the faith of visionary promises of results foreshadowed by plausible commentary from those who write and speak on the prospects of gold mining without having had any or little practical experience, which ends in the usual results of failure, disgrace, and disappointment.

THOMAS CORNISH, M.E.,
Author of Gold Mining: Its Results and its Requirements.

OPHIR AND RUSH VALLEY MINING DISTRICTS—No. VI.

SALT, GYPSUM, COPPER, AND OTHER MINERALS.

SIR,—Fifteen or twenty miles below the railroad station at Salt Creek, and on the Sevier, are seemingly inexhaustible quarries of salt and gypsum; the former yielding 90 per cent. of the pure article. Work is steadily going on, and a considerable amount of tons are shipped daily to the Ontario Mill for chlorodising purposes. The northern part of Utah abounds in salt springs, perpetually pouring into the Great Salt Lake and into Beaver Lake. The brine of Salt Lake is about 17 per cent. solid matter, averaging the lake, 85 per cent. of which solid matter is salt. The water evaporates, and by this process glauber and Epsom salts separates from common salt. The sun manufactures in this way thousands of tons every season. Of this about 5000 tons are annually used; the rest is reabsorbed by the spring tides and storm waves. The price in Salt Lake City of the crude article is $5 to $6 per ton. Gypsum is abundant in Utah, the most notable beds being in San Pete, above Cove Creek, on the Muddy, and by Nephi. One vertical ledge is 100 ft. wide.

In the extreme north-western section of the country, within easy distance of the railroad, a copper district has been opened. The veins lying in micaceous shale, associated with porphyry, and varying from 5 ft. to 20 ft. in width, appear to carry almost all of the ores of copper, but mainly the oxide and glance, which yield sometimes as high as 50 per cent. of the pure metal. The mines are considerably developed, and the prospects exceedingly good. There also appears copper in Copper Gulch, San Francisco district, Tintic, Cottonwood, Snake district, Red Butte Canyon, Bingham Canyon, Antelope island in the Great Salt Lake, all over the Beaver county; and, in fact, a great part of Southern Utah, and in the granite range between Salt Lake City and Ogden. In view of the proximity to the railroads and the fine country in which they are situated these districts bid fair to become important in the near future.

Mica is found in large quantities in Southern Utah, and also in the mountain range separating Salt Lake from Weber Valley. Various kinds of other salts are found in the various parts of Utah in shale and as surface efflorescence. On the Salt Desert, west of the Great Salt Lake and also west of Utah Lake, there are found great quantities of excellent saleratus. In other places further south there we find shales and beds of exuded salts in quantities and qualities sufficient to justify all the attention of parties interested. All varieties of clay abound in Utah. Remarkable of these are—The deposits west of Utah Lake, those of American Fork, of West Mountain, of San Francisco mining districts. It is soft, and can be cut, hardens on exposure to the fire; in fact, we have the most desirable clay to manufacture bricks, fire-brick, potters' ware, and porcelain. Building stone abounds all over Utah, is easy accessible, appears in manifold varieties, and seems to be inexhaustible. First and foremost we have the granite of the Cottonwoods; the red sandstone of Red Buttes close by and east of Salt Lake City; the oolite or white secondary sandstone of San Pete and Castle Valley; the with-iron impregnated limestone of Logan; the beautiful Logan marbles. The Utah marbles are black, banded, variegated, cream coloured, grey and white; they all can be polished, and are found close by and north of Salt Lake City, on the islands of the Great Salt Lake, at Alpine City, Provo, Tivoli, Snake District, Dry Canyon, Frisco, and in Southern Utah all over.

The best and finest slates, of a green and royal purple, in large, almost inexhaustible quantities are found, and particular to be noticed are those of Antelope Island, in the Great Salt Lake. These slates excel for roofing, &c., all imported eastern slates.

W. BREDEMEYER, M.E., U.S. Surveyor.

Salt Lake, City, Feb. 8.

MINING ENTERPRISE IN UTAH.

SIR,—I read with much interest an article credited to the (London) *Mining Journal* with the caption, "Why Mining Requires Capital," and, therefore, forward the subjoined facts, for the accuracy of which I can vouch, in the hope that they may be of service to your readers. In the territory of Utah, and some 60 miles from Salt Lake City, an English company purchased some mining property. I cannot give the year, but it must have been, I think, previous to 1878. They built a large 20-stamp silver mill, with a fine roasting furnace attached, and a number of other good and serviceable buildings. I think they also brought in water at some considerable expense; but this may have been done by another company, into whose hands the property came. I am told that the cost, not including purchase or working in the mine, was over $100,000. A shaft was sunk on the mine to a depth of about 360 ft. I cannot say whether drifts were run or not, but I think not. Work was stopped at that depth, and was never renewed by that company at least. It was silver ore they were after, of which there were fair indications. Considerable rich ore (horn silver and chloridic) have been taken out since, or about that time, but I believe no permanent silver mine has yet been found. At the time I was there I saw one small chamber from which $60,000 or $80,000 had been taken. This was one-half or three-quarters of a mile from the mine first spoken of. It is very evident to anyone who now visits the property what some of the mistakes were that finally resulted in bankrupting the company. The principal one was, of course, in building the mill before they knew whether they had a mine or not, but this need not have been fatal had they had any new or strange rock or other material through which they passed carefully tested and assayed. By neglecting this one thing they threw away the only chance they had of making a complete success of the enterprise.

Now, next to this property were two mines, their end lines joining or near to the side line of the silver mine. One of these showed signs of having in it a large cinnabar deposit, having a well-defined vein over 40 ft. wide. On the other a small vein cropped out 3 ft. or 4 ft. wide, of the same ore. When they were sinking that shaft they struck and passed through at a depth of 200 ft. a vein of cinnabar (of the same character as above) 7 or 8 ft. wide, and dipping to the west. No attempt was made to sample or assay it. It was afterwards found that this vein was the earnable one mentioned above as showing 3 or 4 ft. at the surface. I suppose the reason why no test was made was because no one suspected that there was any other mineral in the ore. But about two or three years ago the owner had some tests made, and found gold in paying quantities.

I measured the large vein when there 42 ft. wide, well defined, in a limestone formation. All of the rock is pay ore, and will net over $10 a ton. The rock that gave the highest in mercury is also the richest in gold. Average ore that I picked out of the vein myself gave 3 per cent. mercury and over $18 per ton in gold. I went through the drift very carefully, and from top, bottom, and sides picked out the poorest looking rock I could find, rejecting any showing cinnabar, and this year, if I remember, 1 per cent. mercury, and over $7 per ton gold.

There is no waste rock in the whole 42 ft. The small vein is of similar character. The strike at 200 ft. shows the continuity and its widening. Probably both come together at depth. The present owner, I believe, intended to operate it himself, and was at one time abundantly able. I understand that he has lost most of his property, and that the property was offered for sale. It would take considerable capital to properly open and develope the mine and erect suitable reduction works; but I saw enough to convince me that if a strong company or party of men would take hold of it, and the business was rightly managed, that in not over two years' time they ought to get back all the money expended in the purchase and development, with at least 100 per cent. profit, and this from the ore now in sight. I am sure that, rightly handled, the property could be made to pay in dividends from $200,000 to $500,000 per year, and possibly more. A railroad now runs within six miles.

In what condition this property is now I cannot say My point is simply to show how one foreign company failed, and through its own fault or its agents; and also to show how, even after failure, another careful and thorough examination would have brought success. It may be that others may take warning, and, by examination now, make a success of what was once a failure. I would suggest to any one thinking of having such an examination made that it be done in a very quiet way. I have known foreign capitalists to have been asked, and to have paid, from five to ten times what the mine might have been bought for. I think, too, many failures might have been avoided if, in addition to the experts sent over here, the assistance of some good mining man in the locality, of integrity and responsibility had also been obtained. EDWD. F. DOLE.

Boston, Massa., Feb. 15.

CANADIAN COPPER AND SULPHUR.

SIR,—Referring to the letters in last week's *Mining Journal* signed "B. B." and "M. C. H.," I attended the meeting of the company last Christmas, and heard the very cheerful speech of the Chairman, and gathered from it positively there would be a dividend at this time. I wrote the secretary some weeks ago as to the next meeting, and he replied it would be in March, and I suppose the accounts will be to Dec. 31, otherwise the shareholders are entitled to some explanation of the delay.

I am clearly of opinion that if there be no dividend for the past year we shall never have one. It is one of those companies alluded to in my previous letter to you, which just keep going a set of directors and officials, but the chance of shareholders ever getting anything is virtually impossible. Let me urge your correspondents to sign their names to their letters; it immensely increases their weight with directors. JOHN GRIFFITHS.

Fareham, Feb. 25.

THE NACUPAI AND CHILE COMPANIES.

SIR,—Referring to the letters of Mr. Nicholson of Feb. 2, and also that of Mr. Garland of Feb. 23, in the *Mining Journal*, all persons interested in these companies will have been both instructed and edified by their contents; but it may also happen that not a few readers will have been much puzzled, and will have experienced considerable difficulty in mastering the merits of the case, and of forming any definite idea on the subject. Assuming this to be so, I will, with your permission, endeavour to dissect these letters, and see if the statements bear upon each other, and can be reconciled with the decision given in favour of the Nouveau Monde Company by the Supreme Court of Justice of the section of Guayana, Cuidad, Bolivar, on June 10, 1881. The substance of this decision was as follows:—

On Sept. 12, 1877, Mr. C. C. Fitzgerald, the agent of the Orinoco Exploring and Mining Company, wrote a letter to Mr. Edmund Snell, the agent of the Sud-America Company, concerning the sale of No. 9 Austin. This letter was sent to Mr. Snell in his capacity as agent of the Sud-America Company, and not to him as a private individual, which is an important distinction. On Oct. 31, 1878, on the strength of this letter, Mr. Snell applied to the executive power of the district, and got himself registered as owner of No. 9 concession. This fact coming to the knowledge of the Syndic in Bankruptcy of the Orinoco Company, that gentleman obtained a decree from the executive, on Nov. 6, 1878, discharging the decree obtained by Mr. Snell on Oct. 31, On Jan. 26, 1881, Mr. Snell again applied to the executive, and got himself registered as owner under a decree of Feb. 28, 1881. On March 15, 1881, the Legislative Assembly sold by public auction the properties of the bankrupt Orinoco Exploring and Mining Company, which included this No. 9 section, with the consent of the creditors, and the Nouveau Monde Company became the purchasers.

Capt. Anthony, the appointed agent of the Nouveau Monde Company, took possession of the company in due course, but on his proceeding to register the properties, in accordance with the mining laws (article 75 of the Code of Mines), he was made aware of the decree obtained by Mr. Snell on Feb. 28, 1881, relating to No. 9 Austin. Thereupon, on March 17, and again on May 6, Captain Anthony appealed to the President of the State, adducing not only the title to the property, including No. 9 section, which the company possessed "in virtue of the certificate of public sale by auction and documents of transfer," but also "the destitution of any right by Mr. Snell to No. 9, submitting authentic documents, which proved that the Orinoco Company exerted acts of full possession of the No. 9, after the date in which Mr. Snell says that the aforesaid concession was transferred to him, and without his having offered any obstacles or opposition whatsoever."

The Supreme Court having before it all the documents gave judgment on June 10, 1881, in favour of the Nouveau Monde Company, giving that company legal possession of No. 9 Austin. In the judgment pronounced by the Court all the facts are clearly stated, and it further declares that the executive, who issued the decree of Feb. 28, 1881, in favour of Mr. Snell had exceeded its legislative power. The judgment says:—"It has been demonstrated that the decree of Feb. 28 last did refer to a question which was not of the competency of the executive power, therefore was without effect, and as such it gains no force by the approbation of the Legislative Assembly, because having trespassed upon the functions of the judicial power such act can produce no effect whatsoever according to the clear disposition of Article 104 of the National Constitution."

Now, let me turn to Mr. Nicholson's letter, and see what that gentleman states in confutation of the above judgment. I do not think it necessary to go so far back as the year 1866 into the history of the property, as it is agreed that No. 9 Austin is alone the matter in dispute, and if Mr. Nicholson acquired this section he did so from Mr. Snell, and Mr. Snell from Mr. Fitzgerald. Nor do I think it material to enter upon the question whether "the present Syndicate of irresponsible individuals" (alluding I suppose to the Nacupai Company) are working on a property consisting of 180 acres, which belongs to the Government, making out that some 70,000*l.* has been expended on (in fact) a mythical possession. All these expressions of opinion may be taken together with Latin quotations and Spanish documents (which few understand) for what they are worth. I only want to deal with facts, and I take Mr. Nicholson's communication in substance to be as follows?—He states that the concession was handed to Mr. Snell in payment of salary, of which he supposes some $10,000 was due. Due from whom? Mr. Snell is stated to have been at this time the agent of the Sud-America Company, and Mr. Fitzgerald was agent for the Orinoco Exploring Mining Company, therefore no salary could be due to Mr. Snell by the latter company. Besides what does Mr. Fitzgerald's letter, dated Feb. 17, 1877, say? "The President advises me that he had authorised you to dispose of Concession No. 9 Austin, which act I consider authority for transferring from this agency to your jurisdiction No. 9 concession." What other meaning can be attached to these words beyond that Mr. Snell was empowered to sell at that time—not to take possession of it for himself or in payment, and then Mr. Fitzgerald to relieve himself from all further responsibility in handing over to Mr. Snell's jurisdiction—goes on to say, "The act of your taking possession and cutting wood supplies from said lands is, doubtless, through correct authority." As much as saying you are acting under authority, which I have not given you. And to finally relieve himself from all further liability as to the acts of Mr. Snell, Mr. Fitzgerald winds up by saying, "I recognise as demonstrative your authority, and on Aug. 25 last consigned the custody of said concession to you, and consider the same conclusive until further advices from the Home Office to the contrary."

Here is a distinct declaration by Mr. Fitzgerald that no sale had been effected, and that the custody of the said No. 9 was handed over to Mr. Snell for the purpose of sale "until further advices from the Home Office to the contrary." How, on the face of this letter, can Mr. Nicholson say—"It appears that this concession was handed to Mr. Snell in payment of his salary, then due." I venture to think that the only interpretation that can be placed upon this letter is, that Mr. Snell had been empowered by the Chairman to exercise jurisdiction over No. 9 section for the purpose of effecting a sale; that he at once took possession for that purpose and proceeds to cut timber; that Mr. Fitzgerald, seeing this, acknowledges his power

to do so under the authority given to him by the Chairman; and that, feeling he is bound to respect that authority, does so, till he should himself "receive further instructions to the contrary;" but not a word can be construed into an actual assignment of the property for value received; and, therefore, so far as this letter is concerned, and the authority therein given to Mr. Snell, it in no way touches the judgment given by the Supreme Court in favour of the Nouveau Monde Company on June 10, 1881.

Such is my interpretation, and, with regard to Mr. Nicholson's ideas of the Nacupai Company, Nouveau Monde Company, Mr. Mavorogordato, and whole Hellenic race, it may raise a smile, but will scarcely assist us to frame a judgment of the merits between the two companies.—*Palmerston Buildings.* A. C.

ST. JOHN DEL REY, AND ITS PROSPECTS.

SIR,—The revelations made in the appeal of the directors of the St. John del Rey Company before the general meeting, and their statements at the last meeting should I think cause some enquiry as to the past statements and promises of the same directors. It seems curious that they should come forward, and ask shareholders to give them power to borrow money, even ask them to contribute, and let the same directors handle it, who have scattered to the four winds the large reserve fund of upwards of 70,000*l.*, in spite of all the advice that I have given them. Of that I will say little, as it has been entirely gratuitous, but had the ordinary course been pursued, and the mine been examined by competent experts, much of this snug sum might have been saved. I have been called a bird of ill omen, because I have stated facts; and you, Sir, have been called to account for publishing the facts that I gave you in my letters, and were led to denounce me to the public. I was content to wait, not that I wished to see the end of the Morro Velho Mine but for my vindication.

Now, close upon the heels of the "Morris" folly comes this steamboat business, which I have all reason to believe the directors know was a great mistake. Matters are going on badly at Morro Velho with the mine, and I predict that whatever money is loaned to the company for further work will be lost. Of course I cannot think that any outsiders will trust their money on such security as is offered without first satisfying themselves that there *is* security. If the mine has failed the machinery, Elephant stamps and "Morris settlers" included, is no security at all. I hope some expert will be sent to examine the mine. The managing director and Chairman is virtually saying—Gentlemen, we have spent all your money—seventy odd thousand pounds—give us at most 100,000*l.* more. If they get it they have their offices while it lasts probably; indeed, such clever men should not be removed. Give them a chance to finish Mr. Schofield's water-wheel at least, and I suggest that the shareholders make them set at work on those tailings at once.

Why they call Cuiaba worth 65,000*l.* I do not see, but it may be that Mr. Schofield's offer of 100,000*l.* (it seems he made it) has been taxed or valued, and so formed a basis of calculation for the directors.

C. de Sabara, Jan. 28. MINAS.

KAPANGA GOLD MINING COMPANY OF NEW ZEALAND.

SIR,—My attention has been directed to a letter in last week's *Mining Journal* written from Cork, and signed by an "Old Miner." Judging from his reference to the mission of General Gordon to the Soudan, I conclude the writer allowed his feelings to be overcome by the excitement of the recent Cork election, and I trust he will now allow political enthusiasm to sink into abeyance, and to deal with actual circumstances connected with this property. In the first place, I have never submitted a "wise plan" to the secretary of this company. I have merely expressed an opinion at the wish of several shareholders that further reports on the property are useless, because we are satisfied as to its value; secondly, as Capt. J. Thomas has year by year made recommendations for the issues of fresh capital to the shareholders, which have from time to time been adopted (but with no practical result in the form of a dividend), the time has now come to ask Capt. Thomas for his resignation, and to place a good working manager on the property at a small salary with a suitable increase when the company is brought into a paying condition.

"Old Miner" says, "I think that Kapanga from the beginning has been managed with sound judgment, practical skill, and also systematically and scientifically, and I know that not the shadow of a charge can be brought against the manager except that he cannot create gold." The above words "I think" sufficiently represent that "Old Miner" is not practically conversant with the history of the present and the old company, neither of which I believe has ever paid a dividend, and which may be described as a history of glowing reports and constant applications for fresh capital. On Nov. 6, 1880, Capt. J. Thomas made a report in which he says that from 1864 to 1868 inclusive 41,518 ozs. of melted gold were obtained; and we know that since then gold has been returned constantly; even in his report dated Jan. 5 Capt. Thomas says:—"A general yield of 2 ozs. per ton" had been obtained. There appears no necessity to "create gold," but there does appear the necessity of sending out someone who can work it. As usual Captain Thomas' report of the above date (Jan. 5) concludes—"the general prospects throughout are highly encouraging," which appears a grim satire to those who have read the same expressions for years.

In a circular letter to the shareholders, dated Jan. 17, 1880, the secretary referred to the plan of reconstruction (which was duly carried out and the necessary funds found), and refers to an "average of 5 ozs. of gold" in recommending that course. At that time Capt. Thomas was of opinion that 15,000*l.* ought to cut the lode, when the mine would be fully and effectually proved." I believe the reconstruction produced 20,000*l.* I do not think the shareholders can directly blame the directors and secretary; the directors are, I believe, large shareholders, and their chief error appears to have been in placing implicit confidence in the local manager. This error is one which appears to have been fallen into by more than one company of late. "Old Miner" says "I know that not the shadow of a charge can be brought against the manager;" and in reply to that I can bring the "shadow" in the following question—Is "Old Miner" in a position to state authoratively that no pilferings of gold by miners or workmen have taken place on the property? I may say that personally I am a very small holder of shares, but have clients who hold a large number, hence the interest I take in the question.—*Bristol, Feb.* 25. WILLIAM W. BAKER.

LAKE SUPERIOR NATIVE COPPER COMPANY.

SIR,—In forwarding the weekly mining report for to-morrow's Journal I intended to have called attention to Captain William's remarks upon the No. 3 level, south of No 1 shaft, and his discovery of native silver at this point. There have previously been some indications of that metal, but its mention in Captain Williams' report is a new feature. Referring to his mention of the "Silver Islet location," I subjoin extract from report of the last general meeting (Dec. 18, 1883), in which that property is referred to:—

"We have neighbours on the western side of the property, but until we began our works they had never attempted to explore their property. They acquired it in 1865. When exploring it they found several lodes that promised to be good. In the month of September they sent a force further inland, two miles from the lake, and at a distance of about two miles they struck a vein of extraordinary value. They broke out chunks of native silver, yielding extraordinary assays, the average being 5000 ozs. of native silver per ton. They found some pieces assaying 19,000 ozs. to the ton. It is extremely interesting to know that, and we should be disposed to congratulate them; but it is specially interesting to us, inasmuch, as I may say, without fear of contradiction, that the vein on which they made these wonderful discoveries is our vein running into their property, and it is perfectly possible, in fact very probable, that as we continue on the course we are now following we shall obtain some of this native silver also. Generally speaking, on the south shore native silver in its metallic form is found, in combination or in contact with copper in its metallic form, although the two are not chemically combined. At any time, then, we may get a rich deposit of this native silver on the run of this vein."

I also subjoin, in advance of the report itself, some facts from Capt. Williams' general report for last year, which will be issued to the shareholders in a few days.

It appears that Capt. Williams' report was dispatched some time ago, but owing possibly to the unprecedentedly severe weather in Canada, and the derangement of the postal service, it has miscarried; however, a copy has just come to hand, and contains the following interesting facts:—A total of 2813 ft. 6 in. of ground has been driven and sunk through during the year, and reserves opened to the extent of 280,000 contract feet, or 49,000 tons of copper-bearing rock, estimated by Capt. Williams to contain 2 per cent. of copper. The stamp-mill and dressing-floors have been completed. At the Harbour, two miles west of the main works, a very promising belt of amygdaloid, carrying heavy shot copper for an average width of 5 ft., has been explored.

By the end of June the reserves, without calculating anything for the Harbour amygdaloid belt, will be sufficient for the present stamp (which crushes 150 tons per diem) for two years. As soon as a winding-engine, which will be ready in April, is erected at No. 2 shaft, another stamp of like capacity can be supplied, and if the belt at the Harbour continues as it is, a third stamp can be supp'ied with very superior quality of rock. Tests with the Diamond drill have proved the existence of shot copper at three different depths on another amygdaloid belt at the Creek. There are on the property several banks of conglomerate containing native copper, and very similar to those worked on the south shore, which deserve particular attention, but which have not yet been tested.

Abchurch Chambers, Feb. 29. DANIEL NORRIS, Secretary.

THE SCOTCH PIG-IRON TRADE ASSOCIATION.

SIR,—The committee of the Scotch Pig-Iron Trade Association think it right to make the following statement regarding the disposal of the production of the only three brands of which any part has gone into store during 1883. The aggregate production of these brands last year was 169,000 tons, of which 131,000 tons were consumed locally and shipped, and only 31,000 tons stored, the balance of 7000 tons having accumulated in the hands of the makers. The insinuations again repeated perhaps make it necessary for this Association to deny that at any of the works have two qualities of iron been made. The iron stored is identical in quality with the iron delivered for consumption, and the whole of the above 131,000 tons has been received by the consumers here and abroad as good merchantable brands—g.m.b. WILLIAM WILSON, Secretary.

Glasgow, Feb. 26.

SEISMOLOGY, AND COLLIERY EXPLOSIONS.

SIR,—A series of observations have recently been commenced at the Takashima Colliery preparatory to the establishment of an underground observatory. I therefore subjoin a short account from the Japan Gazette, of last Saturday, of what has been done, as it will no doubt be of interest to the readers of the *Mining Journal*:—"A few weeks ago Prof. John Milne, of the Mining Section of the Imperia College of Engineering, Tokio, left here for Nagasaki for the purpose of establishing an underground observatory in the Takashima Colliery. This coal mine, by far the largest in Japan, is in the island of Takashima, about nine miles from Nagasaki, and is the property of Mr. Iwasaki Yataro, chief of the Mitsu Bishi Company. It was through the courtesy of the Mitsu Bishi Company that Prof. Milne was enabled to visit the mine; and he expresses himself deeply indebted to the company, Mr. John Stoddart, the chief mining engineer, and the other officials of Takashima, for the many kindnesses and assistance rendered to him throughout; and to which is entirely due the initiation of experiments which may prove of great value.

The colliery workings, which are said to have an extent of about 70 miles, are not only beneath the island, but extend in different directions beneath the sea, for the superficial area of the island is very small. The output of the mine for 300 days yearly varies between 900 and 1500 tons, and this affords employment to several thousand workmen. Owing to the peculiar nature of the coal chemical decomposition occasionally takes place with sufficient rapidity to raise the temperature to as much as, sometimes higher than 120° Fah. This is a difficulty in itself that must be encountered sooner or later, for if that temperature should be continuous working would become almost impossible. Another difficulty with which the miners have to contend, over and above the abnormal temperature, is the escape of gas, technically known as fire-damp, the presence of which necessitates the employment of safety-lamps, and is a constant source of danger and cause of expense, the mine being now on fire. Hitherto no satisfactory means of detecting this gas has been discovered, although Government have offered and continue to offer substantial rewards to encourage investigation. Observation has, however, disclosed the fact that there is a relationship between the issue of gas and atmospherical pressure indicated by the barometer; but this is deceptive, for in the majority of cases the escape of gas occurs some time before the barometrical fall has been recorded. At Takashima, for instance, the interval is said to be six or eight hours, so that the warning of the barometer is too late to be of any value except from a scientific point of view.

One of the objects of Prof. Milne's visit to Takashima was to make experiments underground to ascertain whether there were any phenomena connected with the escape of gas, such for example, as the occurrence of small earth tremors, which might hold a nearer relation to the evolution of gas than barometrical changes. As so many experiments have been made in these matters in various parts of the world, Prof. Milne's hopes of success are small, but as the subject is of such vital importance to the safety of life and property not only in Japan but in various parts of the world, he feels the investigation to be worthy of the trouble. However, Prof. Milne may be assured of one thing, that is, the results of the experiments will be of immense scientific interest.

These experiments, which as yet can hardly be said to be inaugurated, are as follows:—1. The observation of earth tremors. These we already know are intimately connected with barometrical depressions, and in Manila, it is said, they afford as good indications of coming typhoons as barometrical variations. Hitherto earth tremors can only be said to have been observed on the surface of the earth, and whether they exist in subterranean excavations is as yet matter of conjecture. The instrument to be employed for the detection of these small earth movements is called a tromometer. It consists of a pendulum enclosed in a tube to protect it from currents of air, and a microscope so arranged that the smallest movements of the pendulum in any direction can be easily seen and measured. A second instrument, which may be employed for the same purpose, is a microphone in electrical connection with a telephone. Professor Milne informs us that during his stay at Takashima creaking and groaning sounds were occasionally heard in the telephone. Sometimes these would continue for several minutes. The microphone was placed in a niche cut in the solid coal.

A second set of experiments to be carried out is the observation of delicate astronomical levels. From observation of these levels when placed on a solid foundation above ground, it would appear that there are daily and seasonal tippings taking place in the soil. Another point of interest was, that when the barometer fell the bubbles of the levels could be seen to surge back and forth through a small amplitude, the surging having a period of two or three seconds. A third set of observations are to be made on the earth currents in the mine, about the existence of which Professor Milne satisfied himself when at Takashima.

Another class of observations will be on the movements which are continually taking place in the roof and floor of the workings. These will chiefly be made with the endeavour to detect how much of the motion may be due to the rise and fall of the tide. The point at which Prof. Milne commenced these experiments is in a working about 500 ft. below the bottom of the sea. To these observations it is proposed to make experiments on the electrical condition of the air in the mine. All these observations will be carried on in conjunction with observations on the barometer, the thermometer, and the rise and fall of the tide."

It is hoped that some of the phenomena to be observed, like earth tremors (which have a relationship to barometrical fluctuations) may be found to hold relationship to the escape of fire-damp. The matter will, I think, be of interest to British mine owners.

Imperial College of Engineering, Tokio, Jan. 17. JOHN MILNE.

IS THERE COAL NEAR LONDON?

SIR,—The sinking of the well at Richmond, Surrey, to which attention was drawn by your correspondent, "D.," in last week's Journal, is a valuable contribution towards the solution of two problems of great economic importance—the existence or otherwise in the south-east of England of productive coal measures at a workable depth, and the position of the lower green sand, or of other permeable beds sufficiently deep-seated and extensive to furnish the Metropolis with a large supply of pure water. But the deep well borings in the Metropolis and the neighbourhood go to confirm the theory introduced by Mr. Godwin-Austen upwards of a quarter of a century ago, from observations of the geology of Belgium, that an axis of palæozoic rocks was prolonged from the Ardennes under the London tertiary district, and that a band of coal measures coincided with the line of the valley of the Thames, where it might some day be reached. Mr. Godwin-Austen, indeed, considered it likely that the coal formation existed beneath the cretaceous rocks lying between the coast opposite to Calais and the Somersetshire coal field, and that the coal measures which tail out under the chalk near to Thérouanne, in all probability, set in again near Calais, thence are prolonged in the line of the Thames valley parallel with the North Downs, and continue under the valley of the Kennet into the area of the Bath and Bristol coal field. Mr. Prestwich, who has also paid a great deal of attention to the subject, appears to coincide with Mr Godwin-Austen. It may also be said in both France and Belgium the coal measures in some districts are concealed beneath nearly horizontal beds of cretaceous and tertiary rocks, whilst, before entering the sea at Calais, the carboniferous strata are concealed by lower oolite, and nowhere reappear across the South of England until Somersetshire is reached.

These facts all point to the probability of coal being found under the cretaceous and other formations in the South of England. But the well borings and sinkings that have already taken place in London, Richmond, and other places, all go to bear out the theory of Mr. Godwin-Austen. The boring at Meux's Brewery at 1064 ft. from the surface beds of undoubted Devonian were reached, and at Crossness, in connection with the London main drainage, at 1008 ft. the Devonian rocks were again met with. This was further corroborated by the sinking of a well between Hertford and Ware. At Harwich, in sinking for water, some important features were also found. In the first place 25 ft. of drift were gone through, then 51 ft. of tertiary strata, 888 ft. of chalk, 61 ft. of green sand gault, and 45 ft. of black slatey rock. Prof. Prestwich considered the slate to belong to the palæozoic period, its exact geological position being that of the lower carboniferous series of the Mendips and the Ardennes. Now we have the important sinking at Richmond, which still further corroborates the view that the coal measures will be met with in the Metropolis, and in all probability extending over a very large area of ground. Mr. Godwin-Austen considered it likely that the lower members of the true coal measures might be expected to occur about a quarter of a mile to the south of Tottenham Court-road and Oxford-street, and the upper or productive coal measures still further to the south. It is, therefore, quite possible, to say the least, that coal will be worked in London; it may even be at no great distance from Buckingham Palace itself. As to depth there will be no difficulty in sinking 1000 yards, and working the coal to a much greater depth. Already at Moss Hall, in Lancashire, the shafts are 920 ft. in vertical depth. It is, therefore, likely that the important question "Is there Coal in or near to London?" is now in a fair way of being solved, and any contribution like that at Richmond brings the solution within more measurable distance.] J. R.

Barnsley, Feb. 26.

FREE TRADE, AND ITS BLESSINGS.

SIR,—In your report from Cornwall in last week's *Mining Journal* I see in the last paragraph an apt and striking illustration of one of these blessings. A number of Cornish miners are about to be deprived of their livelihood because too many are now employed in some mines, and, again, some mines are about to stop altogether. And it appears that the Cobdenite panacea of emigration is not now such an open way of escape from starvation as it was some years ago, whilst it would be a pity that Cornwall should be still further denuded of its skilled miners for the benefit of foreign nations. It is indeed a pity, and any man but a hard-hearted, merciless political economist would feel indignant that our home workers should have to leave their native land, and that home industries should be crushed under the Juggernaut of Cobdenite Free Trade in order that a scheme devised by a few rampant orators 40 years ago, not to benefit the working class, but to further their own political aspirations after fame, should be still fostered and upheld, no matter at what cost to the people of Great Britain. Common sense, reason, and incontrovertable facts are set at defiance, and the precepts and examples of other countries are set at naught. It is not that the people are blind to the fact that since Free Trade has reigned commercial home interests have been going from bad to worse; but the nation is absolutely under a spell, which it seems afraid to break. It is like a bird under the baleful gaze of the rattle-snake. The bird might, we imagine, easily fly away, yet it cannot. It is paralised and petrified, it knows not how or why. In like manner this country is enthralled by the lethal deadly policy of John Bright and hiscompany of the oppressors of British workmen and British employers of labour, whilst though the latter might easily escape by sending all Cobdenite lumber to the hades of oblivion, they are unnerved, and dare not question the wisdom of "the peoples' tribune," and the senile hangers on to his doctrine of Free Trade.

The total British imports were for 1882, 412,002,000*l.*; 1883, 423,604,000*l.*, an increase of 13,602,000*l.* The total of British exports were for 1882, 241,467,000*l.*; for 1883, 239,830,000*l.*, a decrease of 1,637,000*l.* The excess of imports over exports was in 1882 170,535,000*l.*, and in 1883, 185,774,000*l.* An increase of 15,239,000*l.* of imports over exports in one year! And thus it progresses year after year, the imports getting larger and the exports smaller. Where is this to end? The Cobdenites, I know, have a hanky-panky logic of their own to prove that this monstrous excess of imports over exports, denotes a growth of wealth and prosperity in our country. A mysterious phantom termed "the balance of trade," the Mumbo Jumbo of the Cobdenites, is paraded before the astounded non-thinking public. Yet the most simple of mortals could comprehend that if he received only 1000*l.* per annum, and had to pay somehow 2000*l.* per annum, he would necessarily at length come to grief.

These are the words of some blind leaders of the blind on their way to the ditch of Free Trade!—"However much we may preach the blessings of Free Trade to other nations they seem further than ever from adopting it. One after another shuts the door, so to say, in our faces, and virtually by protective duties prevents the entrance of our goods. No other country is so placed." Certainly not, for no other country has dismissed its sense and reason to hearken to the schemes of political gamblers striving for place and power under the *nom de plume* of philanthropy. The writers I have just quoted never for a moment call in question the Free Trade sham; they are merely amazed that other nations will not be fools, such as we are, and keep open house for us as we do for them.

British coal is being, as it were, given away to France and other nations at such a price that coalowners have to fight with their men constantly, and grind them down to the lowest penny in the matter of wages. The foreigners must have our coal. Then why not make them pay a duty on every ton of coal they are bound to procure? And why should not the Americans be compelled to pay a duty on all their grain, which they can only find a market for in Great Britain. There is an infatuation which, though it effects only one home industry, matches the infatuation of Free Trade.

The manufacture of tin-plates is a monopoly, and were the manufacturers to combine, and honourably stand by each other, the strong helping the weak, they could command their own price for tin-plates, and in one year realise more profit than they now do in ten. It is true that this course would set up foreign rivals sooner than

will otherwise be the case; but the rivalry will come slowly it may be, but surely; and which would be preferable, 10 years of large profits or 20 years of the merely nominal profits and heavy losses, which are now, and have long been, the distinguishing characteristic of the British tin-plate industry? It really seems as if the Free Trade mantle of folly and delusion had fallen upon tin-plate makers from the shoulders of Cobdenite Free Trade.

Your correspondent, "Leader," I would respectfully observe appears to labour under some errors. He thinks that the small stocks of lead tend to depress the market. Were the visible stocks of tin to become only hundreds of tons where they are now thousands would that depress the tin market? And is there a peculiarity about the heaviest metal that light stocks mean low prices? What next? If producers were to store their lead, says "Leader," the market would improve. Quite true, and "bulls" and "bears" would rejoice thereat. But stocking lead is not consuming it, and only a real consumption of that metal can lead to a permanent continuance of remunerative prices. The depression in the price of lead is, says "Leader," mainly due to the foreign lead mines having fallen into weak hands. These weak hands have pulled down the price of lead from 24*l.* to 12*l.* per ton. Now, if weak hands have done all this, what might not strong hands have effected? We should probably have had lead at 8*l.* per ton, as another of the unspeakable blessings of Free Trade.—*Feb.* 23. ——— RECIPROCITY.

THE AMALGAMATION OF GOLD

SIR,—I have not the time and I certainly could not trespass on your valuable space to carry on a useless discussion with Mr. Readwin, but one remark in his letter in last week's Journal I cannot allow to pass without correction. He says after speaking of Mr. Bell and myself, "yet everybody then failed at its economic extraction." Now, the only failure that attended my labours in Wales was produced by handling mercury in an unusually wet season in an exceptionally wet district. After a few weeks of successful work, and on one occasion getting as much gold as 17 ozs. per ton of quartz, I was prostrated by illness, and having been told that at the winer season my recovery would be slow, I resigned my position as manager. With such results is there any sign of failure, as named by Ir. Readwin? Whilst at the mine not more than 1000*l.* was spent, and I can truthfully say a finer mining plant for reducing ore was never got to work—all was from my own designs, and erected under my own personal superintendence.

I never saw my successor, but I saw some thousands of pounds worth of worthless machinery that the directors had been induced to purchase lying rusting on the ground, and I was informed that more than 100 flasks of mercury had been lost in the tailings. Whilst I was there not more than 1 lb. had been lost from all causes. I never saw or heard of any of the ores that Mr. Readwin associates my name with, nor have I seen the specimens he refers to; but I have seen no less than seven metals in one stone, not one of which interfered with the working of my amalgamator, and I never on any occasion in my life used anything but the purest quicksilver I could obtain or produce by retorting. I forget my successor's name, but Mr. Bell was not at the mine for three years after I left it.

I thank you for allowing the certificates from the officials at Conrad Hill to appear in the Journal, and I ask the favour of your inserting two from practical men that reached me just as I was leaving North Carolina. Mr. Wm. M. Treglown, mining expert and engineer, of New York (Feb 7) writes:—"At the request of my friends in New York, as well as yourself, I visited the Conrad Hill Mine, in North Carolina, and examined your wave-plate amalgamator, and find it the simplest and most economical machine in practical use, requiring neither attention whilst running but oiling. Was run one week without cleaning out; and whilst I was there the superintendent had it stoped and cleaned out, and re-charged and set to work again. The time occupied in doing this was less than 20 minutes. They are treating with your machine oxidised sulphurets direct from the furnace, and were amalgamating 90 per cent. of their assay value." . . . Mr. T. W. Valentine, of Boston, Mass. (Feb. 7), writes:—"During the many years that I have been engaged in gold mining I have taken especial pains to examine all the appliances and machinery in use and invented for the purpose of amalgamating gold. . . . I have since had the pleasure of seeing it in successful operation at the Conrad Hill Gold and Copper Company's Works, where it has been in constant use for 20 weeks, and I am convinced that it is the best amalgamator ever made." . . . I thus leave others to speak for its doing. I thank you for your kindness.

Leicester, Feb. 26. ——— HENRY MOON, M.E.

GOLD AMALGAMATION.

SIR,—I was glad to see Mr. Moon's letter on this subject in your last issue. I assure him that I have no desire whatever to "bandy words" any more than he has. Neither do I wish in the least to undervalue his invention. He is returning to England, and, consecently, his amalgamator may be made to speak for itself, and for him, too, by complete success or otherwise. Mr. Moon, however, challenges the whole range of amalgamating processes, and there is no egotism in his doing so if he can perform what he says he can—"get the last particle of gold out of the ore, and use nothing but pure mercury." He says emphatically, "I assert that I can secure it to the last particle, no matter with what it may be in combination." Vide *Mining Journal*, Jan. 19.] Now the question at issue is, Has Mr. Moon accomplished this? This is really what I have been pegging at all along. I do not care half a straw whether his amalgamator is better than mine or not. He more than implies that his invention is better than everything else of the kind in the known world. So be it.

The evidence towards proof of this as quoted by Mr. Gosset, did not, to my thinking, prove Mr. Moon's case conclusively, and I, therefore, took exception to it. Mr. Moon now heralds his own advent by putting forward more proof of the kind from Conrad Hill Gold and Copper Mines, M'Kee, Davidson County, N.C. These proofs are contained in four certificates emanating from three officers of these mines—two from Mr. Clayton (whom I take to be the manager), one from Mr. M'Kee, the superintendent, and the other from Mr. Ninnis, the assayer. In these four certificates I cannot find anything like proof of the accuracy of Mr. Moon's confident assertion as to "the last particle" of gold being extracted or extractable. Mr. Clayton says in his certificate of Oct. 6, "It is the most efficient and economical amalgamator of which I have any knowledge." In the second (Feb. 2) he says: "I consider your machine as the most valuable of which I have any knowledge." Mr. M'Kee (Feb. 6) little more than endorses Mr. Clayton's letter of Oct. 6, and wishes Mr. Moon success. Mr. Ninnis (Feb. 6) says, "the machine continues to do practically clean work." Now, admitting the absolute truthfulness of these certificates, the only hint at the "last particle" notion is to be found in the assayer's certificate, and that is in the expression "practical clear work," which means, if it means anything, some degree of remoteness from getting the ultimate particle.

The chief point in the certificates is that the amalgamator in question got a larger percentage of gold than "the batteries using the plates." This is well, but it does not affirm that no gold at all was left in the said amalgamator's tailings, which alone would touch the sharp point at issue. On this head the assayer writes, at Mr. Moon's request, as follows:—"It is only occasionally now that I make my tests for gold of the tailings. The results of the first two months, when samples were regularly taken, proving so uniformly satisfactory as to make the continuation of such unnecessary." As I have said I do not doubt the truth of this; still the value of it all resides in the expression, "practically clean work." This is as much, perhaps, as can or ever will be said of any amalgamating machine whatsoever. It is quite enough too, but I submit that had the assayer been able to certify to the extraction of the "last particle" of gold in the ores by the machine, it is fair to infer that under the circumstances he would unhesitatingly have so certified. Mr. Ninnis has not done this, and I regret that Mr. Moon, and I, therefore, still remain at issue anent "the last particle," and I fear that we shall so remain to the end of the chapter.

At the old Glasdir Mine, in Merioneth, in 1882, I had dressed nearly 500 tons of mixed copper and sulphur ores, containing much arsenic occasionally, which was sold to Vivian and Sons at Swansea for nearly four guineas the ton. This mixed ore was called by them "argent ore." A considerable number of fire assays were made at the mine by my own assayers. The results varied from about 3 dwts. to several ounces of gold, and from 2 to 8 ozs. of silver to the ton, averaging, perhaps, as much as 1 oz. of gold, and 4 or 5 ozs. of silver to the tin of ore. Sundry trials of tons of this ore by amalgamation with ordinary distilled quicksilver gave of gold next to nothing, and by my own process with quicksilver about 5 dwts. to the ton at a cost of about ½ dwt. of gold. A good deal of the contained gold I have strong reasons for believing was in certain states of combination which rendered it altogether non-amalgamable.

This is rather a heterodox notion, I know, but it sticks to me like my antiseptic initials, for all that. This rather large lot of ore referred to above contained on the Vivians' averaging only about 5¼ per cent. of copper; yet they wished to have as much as they could get of it. The mine suspended work shortly after this satisfactory experiment. It is, however, upon the point of resuscitation with adequate capital. This done, a fine field will be opened to Mr. Moon to prove whether he can get "the last particle" of gold out of these poor cupreous ores with pure quicksilver only. Frankly, I cannot do so, and, therefore, he has no rival in me. I have never thought it possible to do it, and I do not think it matters a straw whether it is ever done or not. One question remains, as Mr. Moon puts it, "Whatever the method, will it pay?" I will reiterate my oft-repeated opinion—"That is the best machine which gets out the most gold, at the least cost, in the least time." Mr. Moon and the rest of the gold millers of the world must acquiesce in this common-sense proposition, and he has, I think, yet to prove whether his machine is not only the very best of all machines for the purpose intended; but also that he can, by means of it, extract the ultimate gold particles. I, for one, hope he will be able to do so.

London, Feb. 25. ——— T. A. READWIN, F.G.S.

GOLD AMALGAMATION

SIR,—In this scientific age when technical education is universal a dogmatic yea or nay must be supported by scientific data, though unfortunately mining matters do not appear to be argued out on the same basis as other sciences, too often, if I may be guided by letters in your valuable paper. Private opinion is put forward as Nature's laws, and a want of technical information is apparent in the statements made as to cause and effect. The correspondence with regard to gold amalgamation would lead practical readers to the conclusion that to be an authority on mining matters it is quite unnecessary to understand the metallurgy of the metal under discussion—that a knowledge of chemistry is simply superfluous, and so purely elementary information as the difference between a sulphide and a sulphate is not always possessed by the gentlemen who subscribe themselves M.E. Were a man to come forward and state he had invented a machine which differed only in its motion with many others of the same class, by the use of which he could extract the grease from wool merely by the aid of cold water, manufacturers would naturally wonder how it was that they had found by experience that water alone had no effect on the grease, while chemists would laugh at the idea, and, perhaps, remark that as water had no affinity for grease till the inventor proved it had it was absurd to talk of the amalgamation of the two.

This appears to me to be a case on all fours with the correspondence that has appeared in the *Mining Journal* respecting the wave-plate amalgamator. It is a fact known by all who have had any experience at all in the treatment of auriferous pyrites that the first step toward the extraction of the gold is the oxidation of the sulphides, arsenides, and the other minerals which hold it in mechanical combination. Now there is an old saying—"A fond mother is a bad judge of her child's beauty." Without wishing to say one word against the wave-plate amalgamator I feel sure the inventor will pardon me for saying that as a rule inventors are not the best judges of the value of their own inventions. Mr. Moon has published the assertion that he can treat auriferous pyrites successfully merely by the aid of pure quicksilver—*i.e.*, he can extract the gold held in combination with, or microscopically coated with such minerals as mundic, pyrrholine mispickel, chalcopyrite, stebnite, &c., by merely passing them through his machine, which differs (if I understand his pamphlet rightly) from other table amalgamators merely in the fact that a rotary motion is given to the mercury (in the hollow backed or concave trough in which it is placed by the aid of an eccentric strap and rod

I think your readers are entitled to ask Mr. Moon the following questions:—First. Has his machine ever been tried on concentrated tailings resulting from quartz containing auriferous pyrites? Second. When and where, also, what was the nature of the pyrites? Third. What was the amount per cent. saved? It will be no answer to these questions to say, I have tried it here and there with good results; the merest novice can save free gold. He has distinctly written that he can, by his simple amalgamator, extract gold, no matter how combined, and he is bound to prove it. Till he does so in a much more satisfactory manner than merely writing letters to your Journal in praise of his own hobby, I fear those who are well acquainted with the difficulties encountered in the treatment of auriferous pyrites will still refuse to believe in the possibility, or even probability, of any mechanical contrivance, either with or without quicksilver, being constructed that will separate the gold held in combination. At any rate, that is the firm belief of ——

Feb. 26. ——— CIVIL ENGINEER.

MOUNTAINS OF ALUM, SULPHUR, AND MICA.

SIR,—Being a constant reader of the *Mining Journal*, and noticing the interest taken therein in mining matters of general interest on this side, both in the United States and in Mexico, the subjoined from a local journal describing some vast deposits of alum, sulphur, and mica found near here will be acceptable to your readers. From my own personal knowledge I know the statements to be true. The writer states that in the northern part of Baja, or Lower California, Mexico, in the eastern part of the Cocopa Mountains, bordering the Colorado desert, about 50 miles in a direct line from the Real del Castillo, and 40 miles from the Colorado River, are found two mountains of alum—one of alum and sulphur, and one of sulphur. The Cocopa range is from 2500 to 5000 ft. in height. The great deposit of alum fills the two mountains from base to summit. These immense banks of alum must be two miles in length by one-half to one in width, an analysis of which shows it to be almost chemically pure. Adjoining these is another mountain of alum and sulphur. In it are found streaks, or seams 2 to 4 in. wide of pure alum. It is estimated that in these mountains there must be 100,000,000 tons of alum and 1,000,000 tons of sulphur. In the coast range, west of San Pedro de Martis, near the coast, and about 150 miles south of the Cocopa alum deposits, are three other mountains of alum of about the same size. The alum is not as pure, containing more silica, but it is free from sulphur. These deposits are not more than 20 miles from the coast—down grade, good wagon road. It is estimated that the amount of alum is about the same.

A little south of the Cocopa Alum Mines, on the desert side of the range, begins the great mica belt. Here is found a fine vein of most excellent mica, known to science muscovite, which surpasses anything yet discovered, on account of its fine texture and transparency. The vein, which is only 14 in. wide on the surface, soon widens to 3 ft., and can be traced for a long distance. Blocks can be taken out 6 by 6, 8 by 8, and 8 by 12 inches, of the finest quality. In the same range, about 40 miles south, this same mica belt shows some fine veins or deposits, which cover the mountains for miles, until they appear in the sunlight like mountains of silver. One of these veins is 3 ft. wide on the surface, and the mineral is of the finest quality. The entire range for 75 to 100 miles is covered with broken pieces, or float mica. At the south end of the range, near San Pedro Martis, there are some very fine veins. Blocks 6 by 6, 6 by 8, 8 by 10, 12 by 12, and 12 by 18 in., can be taken out of the finest quality, but this is almost an inaccessible region at present. Thus far but little or nothing has been done, as the whole country is new, almost unknown, the southern part unprotected and unexplored. The new gold discoveries, which are near, will soon open up this entire section: 700 men, 60 of whom are Mexican soldiers, are in the mines. As soon as cold weather comes hundreds more will go there. The whole country is rich in gold, silver, copper, mica, and nickel. In these mica belts, as well as in the alum, there is a wide field open for capitalists, which can hardly fail to be remunerative. Already an American, English company has been organised to mine and ship the alum, also to convert it into aluminia powder, and then into aluminium—from which the celebrated aluminium-bismuth bronze goods will be manufactured. The Bee Line Railroad will pass within 20 miles of the Cocopa alum mountains, and directly through the mica belt within four miles of some of the best mines.

Three large veins of fine nickel ore have lately been discovered near the Real del Castillo, yielding as high as 45 per cent. of nickel; also, one near the Cocopa mica mines, one near the San Pedro Martis alum deposits, and one near the south end of the San Pedrol Martis range. The latter has just been sold for $80,000, three weeks after its discoveries. Since Prof. Rockwell has demonstrated that pure nickel can be produced direct from the ore by one step only, and that nickel ore, carrying 4½ per cent. of nickel, can be worked with a profit, these new discoveries of nickel become very important. The alum, mica, and nickel belts of Baja, California, must present a good field for the investment of capital. The Cocopa Indians have brought in at different times fine specimens of tin ore weighing 314 lbs. They said it was found in the Cocopa Mountains, east of the Real del Castillo.—*San Diego, Cal., Jan.* 31. D. K. A.

BLACK HILLS, DAKOTA TERRITORY.

SIR,—It is well known that Rapid Creek for over 30 miles, at low water, prospects well in gold; and it is equally well known to our population that it has been impossible to work it profitably, owing to the shortness of the season on which it is only safe to calculate—six months; and the narrow bed of the stream, high perpendicular walls making it very dangerous to encounter cloud bursts or water spouts, which are of frequent occurrence, and the annual spring freshet, when the water usually rises some 20 or 30 feet in places, sweeping out all dams, sluices, and other mining improvements. Such a freshet took place in May, 1883, and carried away about one-third of the town of Deadwood. Hundreds of thousands of dollars have been lost in trying to work the gravel claims on Rapid Creek, and all have called. Over 22 miles of claims on this stream were sold to a Boston company for $20,000, and they are now for sale at a low price. One difficulty is that in the creek there is about 3 cubic yards of rough rock and boulders, and 1 cubic yard of gravel, and it is difficult to find a place for the rock.

A tunnel was run on one claim in a bend of the stream, but is a failure, and cannot be protected from the freshets, which are liable to come at any time. To work below the surface a few feet in the bed of the creek is impossible, as the water is inexhaustible; but at certain times the prospects of an expert would be flattering. At present these mines (situated on Rapid Creek) could be bought for a few thousand dollars, yet a New York syndicate is projected to place the mine for sale at some $200,000, upon the representation that the former owner (one of the syndicate) will lease the property and pay $10,000 per year royalty and give bonds to that effect. When the expert arrives to see the mines men are hired to show work, gravel is panned on the mine that shows well, but the result is liable to be a disastrous disappointment for the purchasers. As it is a detriment to all American mines and miners to have such properties placed on the English market, and being largely interested in mines and mining, I trust you will at least give the gist of my letter in the *Mining Journal*. California mining is looking up, more mines are now being opened and worked than for many years. The people seem to have had enough of stock gambling and are settling to legitimate gold mining with good success.

San Francisco, Cal., Feb. 8. GORHAM BLAKE, M.E.

SHROPSHIRE LEAD MINES.

SIR,—The mines here prove good in depth, and with a rise in the price of lead we expect to see the mineral ground in this district developed to a far greater extent than it ever has been, and we are glad to see that some lead mining gentlemen have faith enough left yet to prophecy that we shall see better prices soon. We heard a person say that the miners in some places were trying to make dynamite do nearly all the work; no doubt it is a great advance in explosives but ought to be used with care, for it is expensive and somewhat dangerous. We have noticed that mine proprietors pay great attention to the miners' wages, and been very careful to keep that item down, when we have thought they were indifferent to other expenses.

MINER

THE REDRUTH DISTRICTS—EAST UNY.

SIR,—Having been cradled in the centre of the principal Cornish mines, and having gained my earliest mining experience in the then leading mines of Gwen and Redruth, I very naturally take a deep interest in watching the development of the mines in those districts. A few days ago I visited Redruth, and while standing on the top of the hill east of the town sadly contemplating the numerous defunct mines which in my boyhood days were the scene of so much bustle and activity a party of miners came along the road. One of them, recognising me, shouted "Holloa, Mr. Kitto; "you down here again; there is some difference in the look of the place now than when you were a boy." I assented, and remarked that as mining was the chief industry of the county I thought the outlook was rather bad. "Y-e-s," said John (that was the name of my friend), "wages are rather low, but I have known the times to be quite as bad, and you know the old sayings, Sir—The darkest hour is just before day, and the tide never went out so far but it came back again, and there are as good fish in the sea as ever were caught." And, pointing to some engine-houses south of the town, he said, "There, Sir, that is where we work, and a better little mine has not been opened in the county for many years."

After getting much valuable information from my friend John, I felt determined to make further enquiries as to the prospects of East Uny. The following is the result. This very promising young mine is situated south of the town of Redruth—which it joins—and contains seven regular and well-defined lodes, the whole of which have been proved to be very rich in different properties to the west. This fact alone gives the property a fair prospective value. The owners are confining their operations at present to the development of two lodes—Davis, and the Great Flat lode. Davis lode is producing some beautiful copper ore; one point at the 82 fm. level yielding as much as 30 cwts. to the fathom, the quality resembling the ore raised in the palmy days of North Basset. The prospects on this lode are good. The next, and perhaps most important feature is the Great Flat lode, which runs through the entire property. In driving the cross-cut at the 60 fm. level they have already come upon some rich feeders of this Champion lode, and if the feeders are a true index to the character of the lode it will be one of the richest discoveries made in the county for many years, as the samples I examined in their crude state were more than half tin. Another favourable feature is the shaft having been sunk to the 92 fm. level they will be able to attack this great lode from at least three different points at the same time, and if each point turns out as there is every reason to expect, the question of substantial dividends is simply a matter of time.

The way in which the affairs of this mine are administered reflects great credit on the executive, and might be copied with advantage by a large number of companies in the county. They have two powerful pumping-engines, a steam whim and capstan, and in addition to the necessary tutworkmen (contractors) and day labourers they have 10 gangs of tributers breaking tinstone, and selling it in its crude state on a percentage varying from 8s. to 13s. 4d. in 1*l.*, and the profits arising from this source affords material help in developing other parts of the property. The only officers of the company are the purser, Mr. R. S. Teague, Capt. Hooper, and the engineers, and the total cost of administering the entire concern underground and at surface is 15 guineas per month. I venture to think that the office work alone in many other companies of equal magnitude amounts to more than this sum. I am pleased to mention this fact, because I have found in all parts of the world that more mines come to grief through extravagant and dishonest management than through any fault in the mines. East Uny ought to

be quite a godsend to the town of Redruth. It is well situated, well managed, and contains all the elements of success.
Gunnersbury, Feb. 25. THOS. COLLINGWOOD KITTO.

BEDFORD UNITED MINES.

SIR,—It must be encouraging to the shareholders here to feel, after waiting so many years for some return for their outlay, that there is a fair prospect of this being speedily realised. The last sale was, considering the low price of metal, a very satisfactory one; and this added to the efforts of the manager to make the next sale 200 tons for one month, is sufficient to inspire great confidence. So far as tonnage goes, this brings the returns near up to the times when such splendid profits were made. And there is little doubt, when the lode is laid open at the 75 (now nearly reached) important discoveries will be made. Anticipating a great increase of returns, I think it behoves the local shareholders to look a little more closely into their interests, and to make an effort to have a louder voice in the general management.—*Tavistock, Feb.* 27. A. S.

WHEAL JANE.

SIR,—I have just received a statement of the accounts passed at the meeting, held on Friday last, and am surprised to see such an amount of arrears due for calls, there being 3056 shares forfeited for non-payment of calls made previous to the meeting, held on Oct. 19, on which there remains due the sum of 2853*l.* 17s. 5d. The late secretary must have been very dilatory in having allowed such an accumulation of calls to remain unpaid. There is also due on the old account the sum of 1826*l.* 19s. 5d., and on the last call 2012*l.* 12s.; such heavy amounts for arrears I have never before witnessed in all my experience of mining. I hope the present secretary will take prompt and immediate action for the recovery of all the arrears due, as several of the defaulters from my personal knowledge are in a position, and well able to pay, but defer doing so until some compulsory measures are resorted to. I hope at the next general meeting to find a more satisfactory statement of arrears, or else I see no other means but having recourse to its being wound up to prevent further liabilities.—*Liskeard, Feb.* 27. B.

CALLINGTON DISTRICT, AND ITS MINES.

SIR,—I am pleased to say that at New Redmoor they are sinking the engine-shaft with all speed by nine ablebodied men. The ground has been very hard the last few months, in fact too hard for the production of much lead, but now the ground is somewhat eased, and the lode producing more lead. At New Holmbush they have now reached the 175, or bottom level, which is being cleared in order to commence driving with a boring machine. The 160 fm. level cross-cut is being driven by Stephens's rock-drills south to intersect the Flapjack lode. The Silver Hill Tunnel, suspended just over 12 months since, is in a fair way of starting afresh, as all the plant has been bought out of the Stannaries Court, and a fresh lease obtained for 21 years.—*Callington, Feb.* 27. JNO. BUCKINGHAM.

WHEAL BENNY.

SIR,—If you will kindly allow me I will answer Mr. Reynolds next week. I purpose visiting the mine on other business, and think I can make my answer more satisfactory and complete if I defer my reply till then.—*Feb.* 28. —— CHARLES W. F. CRAUFURD.

LEAD MINING.

SIR,—It may interest the readers of the *Mining Journal* who are deploring the present stagnation in this great industry in England and Wales to know a little of what is going on in other and not very remote parts of the world, where similar works are engaged. I will with your permission give a few extracts showing the state of lead mines and their flourishing condition within a few hours' journey of London. The Coblentz Zeitung (Feb. 16) says:—"Braubach, Feb. 15.—People lately passing our landing stage at the Rhine might have fancied themselves to be in a small harbour town, as no less than five large vessels were being charged with the produce of S. B. Goldschmidt's lead and silver mines, whereby a large number of teams and drivers found a well-paying employment. The same mine also shows great activity in sending off ores as well as receiving coals by the railway. The whole working of the mine has been greatly extended under the careful supervision of the managing director, and the buildings have also been enlarged to a great extent. A special kitchen connected with the dining hall, as well as a separately situated hospital for the workmen, are among the latest improvements. The Lead and Silver Mining Company at Ems also continue their extensive operations, and they have now begun to explore the Schweizerthal, near Miellen, with good prospects of extending the workings and enhancing their property." From the same publication I find that the lead and silver mines at Ems during the years 1880-1 produced 62,000 tons (English) of lead and 7½ tons (English) of silver." That the Gewerkoschaft Mine, Braubach, was during last year worked with much vigour, and in March last sent two parcels of silver of over 1½ ton each to Frankfort-on-Main for refinement. At the Mechernich Mines, where from 3000 to 4000 people are generally employed, they last year divided 13 per cent., notwithstanding the miserable price of lead.

If we contrast this activity in lead mining abroad with the stagnation and deserted state of lead mines in Cornwall, Shropshire, Cardiganshire, Montgomeryshire, Flintshire, &c., we find one if not the chief causes of the latter is the illiberal manner in which all mining is treated by the freeholders or lords. In the mines above named the royalties seldom exceed 2 or 3 per cent. on the returns, whereas in many English and nearly all Welsh mines they are three times the amount, and in some instances, as in Montgomeryshire, to my knowledge, the dues exacted have been upwards of 1-12th of the gross earnings. Add to this heavy charges for damage to almost waste lands, heavy fines on renewal of leases, &c., and little wonder need arise if the present state of things continue. Until landowners can view with a little more sympathy the efforts of others to expend money on the improvement of their properties, to develope mines, and await with the patient shareholders for a larger return from the mine when paying, I fear English capital will seek a more profitable channel for employment, and English miners will be deprived of a fair chance of earning a livelihood, whilst the English shareholders will still bemoan the influx of foreign ores on an already greatly depressed market.

Cannot an effort be made to induce these short-sighted landowners to see that they are not only standing in their own light in restricting the employment of capital, but that should the price of lead at a future time advance, yet from the abandoned and retrograde state of the mines the capital required to reinstate them would be so great as to preclude the advisability of employing it, and consequently their mines would even then to a great extent remain idle. As this is so serious a question to all who have an interest in English welfare I trust you will be able to find a small space for the insertion of these remarks.—*Finsbury Chambers, Feb.* 27. ESMA.

ASSAYING GOLD AND SILVER ORES.—The name of Mr. C. H. AARON, of San Francisco, is already known to the readers of the *Mining Journal* from his previous works on the testing and working of silver ores and on leaching gold and silver ores. He has now issued another little volume—Assaying: in Three Parts. Part I. Gold and Silver Ores. By C. H. Aaron, Metallurgist. San Francisco: Dewey and Co.—which will be equally acceptable to practical men. It is clearly and carefully written, and is intended by its author for the use of miners, prospectors, and others, who only care to know how to assay gold and silver ores and bullion, more especially for the use of those persons not familiar with chemistry. No symbols are used, everything being plainly stated and clearly described. The scope of the book is shown in its table of contents:—Introduction; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables. These assaying tables give simple directions for figuring out results. This is, no doubt, one of the simplest, cheapest, and most easily comprehended work on assaying yet published.

REPORT FROM CORNWALL.

Feb. 28.—If there has been no noteworthy gain during the past week there certainly has been no loss, and we are inclined even to lay some stress upon the incidental signs of improvement that may be observed in various directions. A "big spurt" in tin has been predicted as probable at no distant date, but predictions are very awkward things to meddle with, and steady advance would be far more favourable than any amount of mere spurting. It is very satisfactory to observe, therefore, that steadiness is the most marked characteristic of the tin market at the present time, and at any rate it is difficult to think of any quarter from which mining may be exposed to any further adverse influence of a sudden and unexpected character.

East Pool has done its duty and something more. A profit of 6000*l.* and a dividend of 18s. are exceedingly satisfactory items to meet with in a mine account at the present day, and they will have an influence for good outside the immediate East Pool circle. There are mines that appear able to keep their heads above water under almost any conditions, and it is impossible in this instance to give the mine itself the whole credit. Good management is always an important factor in the prosperity of even the most productive of mines, and here while the average produce of the tinstuff has somewhat increased, the workings have been carried on in such a way that the reserves have increased likewise. It is interesting to note up that while the adventurers make a profit of 6000*l.* Mr. Basset takes dues to the amount of just 1000*l.* A rate of one-seventh dues on gross profits would, therefore, be an exact equivalent, and this may give some clue as to the proportions to be expected when the long-looked for and much-needed reform really comes.

If the Duke of Buckingham is prepared in the case of Perran Consols to grant a lease on the only common sense and equitable condition of dues on profits—and we are not at all prepared to say that the statement is incorrect—it is very difficult to understand why, in the case of Penhalls, he should limit his liberality to the offer of a reduction to 1-48th only. True, there are other lords concerned, but there is no compulsion upon him to follow their lead, and it was quite open to him to have set them a better example. It is certainly quite as important to keep an existing mine in operation as it is just now to start a new concern. Indeed, most people would regard it as far more important. May we hope it is not too late for the lords of Penhalls, seeing that his Grace is so liberally disposed, to reconsider their position. If not, we very much fear that the consequences will be unsatisfactory all round.

Moreover, the Duchy authorities have shown what we must now regard as their usual liberality at Blue Hills, and have entirely remitted the dues during pleasure. What a change has come over the Duchy policy within the past few years. It is not so very long ago that the Duchy was about the best abused lord in the county, and rightly, for its grip was felt in every direction. Probably, it is not regarded in some quarters, and in some relations, as quite immaculate even yet; but, certainly, there is no need to take exception to its attitude towards the mines. We are not without hope that the present depression may leave a more important legacy of good behind it than either of its predecessors, and may lead to a revision of the dues system and its being placed upon the equitable basis so often noted and advocated, that there are several lords who need considerable education even yet, and the adventurers must educate them.

A desire haas been expressed more than once lately that a little competition should be introduced into the tin smelting business; and perhaps there may be some sanguine persons who believe that this is possible, and that the proposal to convert the Tamar Smelting Works into a company may tend in that direction. That it would be possible as a matter of actual feasability may be conceded; but that it is possible as a question of fact experience so far has utterly negatived. All independant efforts so far have ended either in failure or absorption within the "ring." One thing, however, does appear to be certain—that while the miners decline to smelt their own produce smelting is a profitable business.

It is not easy to make out the rights and wrongs of the Tregembo fiasco, which was so utterly unexpected, and perhaps the wisest course will be to refrain from comment further than this—that if the mine is to have another trial the best steps appear to have been taken to that end.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 28.—The Coal Trade continues in an unsatisfactory condidition. Production is excessive, and yet there are evidences that the large joint-stock companies intend to still further increase the output. The demand is slow, and the prices actually realised leave only a small margin for profit. Furnace and ordinary house coal in the Dudley district is quoted 9s. 6d. to 10s. per ton; best forge coal, 9s.; best rough slack, 4s. to 5s. 6d. per ton. Pig-iron is going off in small lots at easy rates. Northampton sorts are quoted 44s., delivered at stations; Derbyshires, 45s. 3d.; and best Leicestershires, 47s. Native part-mines are 45s. to 47s. 6d. Manufactured ironmasters on 'Change in Birmingham to-day reported that merchant orders are coming forward with a little less reluctance. This feature is noticeable in the experience of some of the sheet makers. Best bars were quoted 7*l.* 10s. to 7*l.*, and common, 6*l.* 10s. to 6*l.* Sheets were 7*l.* 10s. and for singles, and 8*l.* to 8*l.* 2s. 6d. for doubles. Mr. B. Hingley, Chairman of the Ironmasters' Association, touched upon the suggested restriction of finished iron make question at the annual meeting last week, but he argued that in this district such a scheme was impossible.

This (Thursday) afternoon the sheet and hoop makers met in Birmingham to define the meaning of the words "Birmingham gauge" in the resolution of last December, when it was determined to uniformly work to that gauge in future. Mr. B. Hingley presided over a large attendance. It was resolved that the gauge adopted should be that drawn up some while ago by the Ironmasters' Association and submitted to Mr. Chamberlain as a desirable legal standard for flat metals. The gauge will be known by the initials B.G.W It was further resolved to apply for an Order in Council to legalise the standard. The advocates of a mutual arrangement for restricting the make of sheets raised that question at the close of this meeting but nothing definite could then be determined upon.

The Hamstead Colliery Company held their ninth annual meeting on Tuesday. The vice-chairman (Mr. Daniel Groucutt), who presided, said that the total length of gate-roads in the pit was now 5910 yards, and that there were 1793 yards of stall heading. In the opinion of the directors the two pits, which had been sunk to a depth of 615 yards, where the Thick coal, 24 ft. thick, had been discovered, would suffice even to enable them to meet an extraordinary demand. The output last week was 2700 tons, but they would not rest content until it reached 4000 or 5000 tons per week; and he could assure the meeting that the directors would not be satisfied with a profit of merely 6d. per ton. With the exception of one point on the estate, near to the boundaries, where a downfall of 23 yards had been come across, the coal was of a uniform thickness, and good quality. The company's prospects were, in his view, very good. The report, which did not recommend any dividend, was passed, and subsequently many of the shareholders descended the pit and expressed themselves pleased with its condition.

At the annual meeting, on Monday, at Stoke-on-Trent, of the North Staffordshire Mining Institute, one of Harrison's coal mine machines, which has recently been brought into use in the mines of the United States, was exhibited. It is small, and more portable than the machine hitherto produced, and thereby would seem to have overcome in much part the chief difficulty in the way of the adoption of coal-cutting machines. Mr. Whitcome, of Chicago, explained the merits of the machine, which excited much interest amongst the members, and it was arranged that experiments should be conducted at an early date.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Feb. 28.—Trade generally, including mining, in Derbyshire is particularly quiet, and a large number of workmen are out of employ at Chesterfield and the neighbourhood. Work in the collieries is worse than it has been for a very long time, and the comparatively mild weather that has prevailed has led to a considerable falling off in the business doing in house coal. There is now no talk about higher wages or the restriction of the output. The action of the men has already brought about the latter, and the former is only a question of a short time. There has been a noted falling off in the carriage of coal sent to the Metropolis during the past month from the leading collieries, including Clay Cross, Eckington, Grassmoor, and Staveley; whilst, as might be expected, prices have come down, so that they have now reached about the lowest point during the last two years. Still, 22s. per ton for inland coal is even now too much, seeing that the pit prices are not much more than one-third of that same. The Pinxton Company are now selling 2s. per ton lower than the merchants, and there is no reason why the same rate should not be general. The Pinxton Company, however, sell direct to consumers, and it is to be hoped that other colliery owners sending extensively to the Metropolis will adopt a similar course. It would put money into their pockets, and at the same time benefit the public of the Metropolis by giving them cheaper coal, and who at the same time would receive an unmixed article. Steam coal has gone off tolerably well of late, for the contracts with the railway companies are in full vigour, so that a considerable tonnage is being sent daily to various depôts for the use of locomotives.

In addition to this, there being an average make of pig, a good deal is required for the furnaces, but not much is being sent away for exportation from any of our ports. Indeed this branch of the trade has become particularly quiet of late, more especially as regards the Humber gas coal, as might be expected is now quieter than for a long time past, and the consumption will of course now get less. All the coke that is made goes off well, and it is surprising that more is not produced, seeing that a great deal has to be imported from South Yorkshire for ironworks in Derbyshire. The iron trade keeps up well considering the state of affairs in the great leading centres, there being a large local consumption. Not so much, however, has been sent into other districts as was the case towards the close of last year. The large foundries, such as Staveley, Stanton, &c., are kept well going in heavy castings, but the smaller establishments are not so well off. The other works along the course of the Erewash Valley are only doing a moderate business as a rule, but the wagon builders appear to be favourably off for work. At Derby the plant works are as usual kept well going, and there is also a steady output of malleable iron.

In Sheffield several of the lighter branches in particular are anything but well off, and there are complaints of the scarcity of orders from America in particular, for but little, comparatively speaking, has come to hand since the commencement of the new year. The leading makers of crucible steel, who have generally plenty to do, are now turning out far below their power, and this shows that the light steel departments are not working up so much material as formerly. Some few orders have come to hand for Bessemer rails, and at rather better prices. Still the production of Bessemer is not so heavy as it was during some part of last year, although cutlery and tool manufacturers are taking a fair quantity in the shape of billets, instead of the more expensive cast-steel. Spring-steel, however, has gone off tolerably well, and a good deal is being absorbed in the making of cranks, axles, tyres, and some other descriptions of railway material outside of rails. In engineers tools and steel wheels business at some few places is tolerably fair, whilst at others it is quite dull. The cutlery houses, taken all round, are the reverse of busy, and some of them find it as much as they can do to keep the hands fairly going. There are a few houses, such as Rogers', who are generally in a position to find their men as much as they can do; and this is the case at the present time. No change has taken place at the Atlas or Cyclops Works, both being busily engaged on their well-known specialities—armour-plates—for which orders are constantly arriving from various Governments. In ordinary ship-plates there is not so much doing just now, and the same may be said with respect to boiler-plates. Some of the foundries are looking rather better in connection with building appliances—such as spouting, pipes, grates, stoves, &c. The engineering works are by no means busy either in the town or district; but railway wagon makers are doing well, several of the firms and companies having heavy contracts on hand that will take some time clearing off.

REPORT FROM LANCASHIRE.

Feb. 28.—The absence of any hopeful feature with regard to the future in the Coal Trade of this district, referred to in last week's report, is being emphasised with the close of the month by a downward movement in prices. The Manchester colliery firms are reducing their delivered rates 10d. per ton on housefire coals and 5d. per ton on other classes of fuel, with some slight modifications here and there in the price at the pit mouth. In other districts, although there is no generally announced reduction, lower prices are being taken to secure orders, and practically it is only in exceptional cases that there are any really fixed rates—sellers, in fact, getting what they can irrespective of their nominal list rates. For all classes of round coal the demand continues of the most limited description; housefire coals still move off very slowly, and requirements for common round coal for ironmaking and steam purposes show, if anything, a tendency to get less. The only description of fuel which is maintaining its price is slack, and this is not because there is any great demand for engine fuel, but the result of the depression in the round coal trade which causes so limited a production of slack that supplies of that class of fuel are getting rather scarce. The orders given out are not more than sufficient to keep the pits going about three or four days a week; where more time than this is being worked stocks are being put down, and collieries that have not had to go on short time for years past have recently only been able to make three days a week. At the pit mouth prices average about as under:—Best Wigan Arley, from 9s. 6d., up to 10s. in some cases; best seconds coal, 8s.; ordinary Pemberton Four-feet, 7s. 6d.; common house coal, 6s.; steam and forge coal, 5s. 6d. to 6s.; burgy, 4s. 6d. to 5s.; best slack, 3s. 9d. to 4s. 3d.; and ordinary qualities, 3s. to 3s. 6d. per ton.

In the shipping trade there has, if anything, been a little more doing, but the actual weight of business all through is still very small, and low prices continue to be quoted. In exceptional cases 7s. 9d. per ton has been got for Lancashire steam coal delivered at the High Level, Liverpool, in the Garston Docks, but there are sellers in the market at 7s. 3d. to 7s. 6d. per ton.

The question of a reduction in wages is beginning to be talked of, but as yet no definite action has been taken in the matter. There is, however, little doubt that the condition of the coal trade, unless some unexpected improvement should take place, will necessitate some steps being taken for lessening the cost of production.

There is still very little doing in any branch of the iron trade in this district, and although in the raw material prices are fairly well maintained, it is not that the demand gives any strength to the market, but because makers being pretty well sold for the present do not press sales. Where orders, however, are wanted sellers find it difficult to get full current rates, and in such cases there is a disposition to give very slightly. Some of the finished iron makers are fairly off for orders up to the end of the quarter; but except that there are a few more shipping enquiries coming out, there is very little new business being secured, and the tendency is towards weakness. The extremely low price at which Cleveland bar iron is now being offered is seriously interfering with local makers, and there are also rumours of a giving way on the part of some of the North Staffordshire houses. In pig iron a few small orders have been given out during the past week on the basis of 44s. 6d. to 45s., less 2½ for forge and foundry qualities of local and district brands, delivered equal to

Manchester. For finished iron the average basis of prices remains at 6*l.* per ton for good ordinary bars delivered into the Manchester district; but it is questionable whether this price is being maintained in all cases.

In hematites there is still only a very small business being done with prices nominally unchanged. In the engineering trades most of the works in this district are kept fairly employed; but there is no great weight of orders in hand very far ahead, and it is only in the locomotive building trade that any real pressure of activity is being maintained.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Feb. 28.—Referring to Mr. Seabrook's letter in the Journal last week I would observe that the damage done by the recent gale to the buildings at Braich-yr-Oen Mine did not affect the interior of the mine, which is, I am informed, looking very healthy, and giving prospects of permanent success.

As Mr. Seabrook observes, the study of the Snowdon copper district is a very interesting one. It may serve to help to explain the matter if I just observe that the whole of the strata of that region run from north-east to south-west. Starting on the north-west from the summit of the Cambrian slate rocks we pass a zone of copper-bearing rocks. These have been worked from the north-west side of Snowden itself at various points along their course by Bettws Garnon, Castell, Celwn, and Dros-y-Coed. These rocks dip under a great thickness of slatey rocks in which the cleavage is often very good, but in which sulphur more or less abounds. Above these come the fine blue slates of Glan-y-Rafon. Bwlchddeilor and Prince of Wales, and the whole of these rocks, underlie the Bala rocks, felspathic ashes and impure limestone, which form the upper part of Snowdon. The whole of the strata described crop up again on the south-east side of Snowdon—copper-bearing rocks, impure slates, and good slates each in its right place, and extend as on the north-west side from north-east and south-west, only on this side of Snowdon there are rather more folds and convolutions of the strata. The whole region is full of interest scientifically and commercially.

The slate trade shows signs of improvement, and quarries are for the most part in full work. The collieries are working without any press of orders, and at low prices. The same is true of the iron works. The Manchester Ship Canal has advanced another stage, and will soon be in Committee. Four separate, and, I presume, rival, sets of engineers are sounding and surveying in the estuary of the Mersey. The result will appear doubtless in the evidence of their respective chiefs.

It was the general feeling at the last Ticketing at Holywell that prices in the lead trade had reached their lowest limit, and that an upward movement might be expected.

TRADE IN SOUTH WALES.

Feb. 28.—As regards the activity of the Steam Coal Trade, while Cardiff last week well maintained its position, Newport gave way to some extent in prices, owing to the abundance of coal. The amount sent away from Cardiff was 150,884 tons foreign, and 14,317 coastwise; Newport, 26,048 tons foreign, and 12,214 coastwise; Swansea, 15,442 tons foreign, and about 11,000 coastwise. The house coal trade remains very quiet. Patent fuel was sent away from Swansea to the extent of 7580 tons and 4485 tons were exported from Cardiff. Steam coal is quoted at from 10s. 3d. to 12s. 6d., while house coal stands at from 10s. 3d. to 10s. 9d. During the past fortnight the house coal trade in and around Borgoed and Pengam has become very slow, and at some of the collieries the men have been idle several days for want of empty wagons. Matters, however, are expected to improve speedily in connection with the house coal trade. The steam coal trade higher up the valley and in the Deri Valley is, on the whole, very brisk. The coke trade is still very quiet, there not being a brisk demand; prices, however remain steady. Mr. T. A. Southen, of Cwmamman Colliery, Aberdare, has outlined very valuable instructions to firemen at collieries. "In travelling the airways," says Mr. Southen, "a fireman should be enjoined to notice that the same are free from all obstructions that would impede the proper circulation of the air; that the regulators, if any, are in good condition, and correctly adjusted; that all doors in use are made to fall or to close themselves, and those not in use are removed from the hinges; that the roof and sides of the air-ways are securely timbered or walled up by packstone wherever necessary; that all hanging pieces of wall are removed or secured, to render the road safe for travelling; that all stoppings, brattices, and air crossings are in good order. He should, moreover, examine all cavities in the roof and open spaces in the goaves, &c., and see that means are adopted to prevent the stagnation of gas in such places. Besides these," add Mr. Southen, "other elements of danger frequently exist, such as blowers of gas, gob fires, and so on, which suggest special injunctions to the fireman."

A correspondent writes:—On the occasion of the recent fatality through the breakage of a shaft rope at Dinas Colliery, a suggestion was thrown out in an influential quarter that it would be a wise precaution to have special Government inspection of these appliances. Her Majesty's present Mines' Inspectors cannot possibly be expected to attend with critical minuteness of examination to these things; they are already heavily handicapped by their multiform duties, and there is ample scope for additional aid in the vast coal area of South Wales and Monmouthshire. It is now pointed out that it would be well, too, that all colliery enginemen and engine-wrights should undergo an examination to prove their capability of taking charge of machinery before they are allowed to do so. Such a step would undoubtedly conduce to beneficial results to all concerned, and be the ultimate means of lessening the risk of lives and limbs of the men who are employed at the mines. It is a well-known fact that the inspection of machinery as now performed in many mines is nothing but a farce. How can it be otherwise, when it only consists of a man looking at the ropes as they are drawn out of the pit? In many cases these are so coated with greasy matter that, supposing he has the best eyesight, he can only see the wires which compose the ropes at intervals. Yet he signs a report that all the machinery is in a safe working condition. This has been going on for years by men who are neither competent to judge by theory nor practice. Catastrophes take place as a consequence—boilers explode, ropes are broken, lives are lost, miners are made cripples for life—all through the ignorance of the men in charge of machinery; and the verdict in 99 per cent. of cases is "an accident."

A great deal of anxiety prevails with respect to the future of the Welsh iron and steel trades. There is necessarily a close connection between these and kindred industries in England, and the facts which apply to the one also bear upon the other. Dealing with the general aspect of affairs, then, this is what is said upon them by a recognised authority, and the works should be accorded every consideration:—As a producer of iron and steel Great Britain has, roughly speaking, to dispose of about a third of her total by way of export. No other country is similarly placed. Markets that used to belong fairly to this country we can hardly approach at all; for instance, Russia used to take very large quantities from us. There they now manufacture for themselves, and, whatever the cause, we have lost a good customer. Their system creates a native industry; raw materials are at hand, they will manufacture, and will make themselves independent of us and others, irrespective of the cost to the country. They make rails in St. Petersburg and send them round by steamer to Odessa. Those connected with the iron industry in this country who seem to have derived a steady benefit during the last few years are the landlord, who owns the leasehold and royalty, the banker, advancing on mortgage or security, the workmen, and last, but not least, the railway companies carrying the raw and manufactured articles at heavy rates, whereas those at whose risk the business is carried on, be they individual proprietors or shareholders, have to confess that, taken as a whole, they have improved but little in position, if at all; and in cases where works are erected on leasehold property, have not been able to write off to any extent on their first value. The amount of steel and iron sent away from Cardiff last week was 2815 tons, and several parcels were sent away from Newport as follows: Gottenberg, 879 tons; Smyrna, 300; Toulon, 63. As regards iron ore, which remains low in price, Cardiff received last week 14,729 tons from Bilbao, and 2566 from other places; Newport landed 8774 tons from Bilbao and 6320 from other places.

The depression in the tin-plate trade continues. Good cokes are quoted at from 15s. to 15s. 6d., and "wasters" at from 14s. 3d. to 14s. 9d. Old orders are, however, plentiful, and little new business is done.

TRADE OF THE TYNE AND WEAR.

Feb. 28.—The Coal, Iron, and other Trades here still wear a dull aspect. There is, however, a slight improvement in some branches. The shipping trade is somewhat better, and freights are rising, but a large number of vessels are still laid up in these rivers and harbours waiting the opening of the Baltic and other spring trades. In the steam coal trade north of the Tyne there is still much depression, but a little more work is expected at the leading collieries this week. The house coal trade in the Wear continues exceedingly dull. The demand for house coal has not improved, and the price of the coal on the London and other markets continues low. There is still a good demand for gas coal of first quality, but the demand for second-class qualities is somewhat limited. There is no change in this demand for other kinds of coal. The demand for coke has improved a little in Durham. There is a good demand for export, and the termination of the strikes of ironworkers on the West Coast has a tendency to increase the demand from that quarter, but the stoppage of furnaces in this district had a depressing effect.

At the Springwell Colliery, near Gateshead, a new shaft to be sunk to the lower seams is projected; so far the seams below the Hutton seam have not been proved here. The Hutton seam was worked many years, and it produced most excellent house and gas coals, but it has been exhausted, and at present the Low Main and Maudlin seams are worked above the Hutton seam; they produce steam and manufacturing coals. Should the Harvey or Beaumont seam be found in a good state (this seam lies about 30 fathoms below the Hutton seam) it will be valuable, and it will greatly add to the value and duration of the colliery. This seam was found in a good state at the Sheriff Hill Colliery, and worked there about 40 years ago. Sheriff Hill is about 1¼ mile north-west of Springwell pits. The same seam was also won at Heworth Colliery a few years ago, and it is now worked extensively there. This old Durham Colliery is situated about 2¼ miles north of Springwell. At the colliery in the Black Fell a boring was made from the Hutton seam down to the Harvey seam about 45 years ago; but no sinking followed, and we do not recollect what state the seam was found in at this point. It is curious to note that the famous Hutton seam extends over a great part of the county of Durham, and it is found in a uniform excellent state as a rule, while the Harvey seam also extends over a large area; but it is extremely variable in its condition. A band of fireclay is generally found in it, and when this band is below or about 12 in. in thickness it is a good seam, the top coal above this band being excellent house coal, and the bottom coal is also of fair quality; but this band often increases in thickness rapidly, so that a good seam is often found at one point, and the seam may be absolutely unworkable only a few hundred yards distant. On the Tyne a little west of Newcastle, on the north side of the river, this seam is in excellent condition, while on the south side of the river the band thickens so rapidly as to render it of little value in less than a mile south of the river. It was, however, worked some time ago at Derwent Crook, three miles south of the Tyne, and it is now worked at the Ousten and Pelton Fell Collieries, and also at several collieries in South Durham. This seam has been well explored in North, West, and South Durham, but as yet the large area extending from Ousten Collieries to the sea coast at Sunderland and at South Shields, has been only partially explored.

The completion of the new shipping staiths at Blyth, on the south side of the river, will soon enable a large quantity of steam coal to be shipped there, and this will be a great boon to the colliery owners who have pits in the vicinity, as a considerable saving will thus be effected in railway dues. The coal and coke shipments at Tyne Dock last week were 96,241 tons, showing an increase of 183 tons, as compared with the corresponding week last year.

There is little change in the position of the Iron Trade. The Wear Rolling Mills at Sunderland have been closed for the present, and many of the finished ironworks in the Tees and in this district generally are only worked fitfully, and consequently there is a reduced demand for pig-iron. Now, however, the ironmasters are blowing out furnaces, and this trade it is hoped will get into a more healthy condition. The shipment of pig-iron to Scotland continues good. The prospects of the iron shipbuilding trade continue gloomy; there are few enquiries for new vessels at present. There is little change to note in prices; they have indeed reached a minimum. Makers of raw or finished iron cannot possibly accept lower rates than those lately current. Ship-plates are 5*l.* 2s. 6d. The steel trade keeps quiet, with no change in prices. Pig-iron No. 3 does not exceed 37s. The employers in the iron trade intend to give notice of a reduction in wages, 1s. per ton in puddling, and 10 per cent. on mill forges, to take effect from the end of next month, when Dr. S. Watson's award expires. Messrs. Bolckow, Vaughan, and Co. will declare a dividend for 1883 of 5 per cent. per annum, writing off 40,000*l.* from capital, and carrying forward about 8000*l.*

The output of Cleveland ironstone for last year was the largest on record, 6,750,000 tons, compared with 6,500,000 tons in 1882. Blast furnaces have been put out by Bolckow and Vaughan, Clay Lane Iron Company, Wilson Pease and Co., Bell Bros., and several others. The stoppage affects the ironstone and limestone mines, and a large number of men have received notice to leave, whilst several collieries have reduced their production, and in the case of the Woodefield, Whitelee, and West Auckland pits, operations are to be stopped altogether.

The depression in the iron and other trades is causing much disturbance in the labour market throughout the district, the masters in most trades are asking for serious reductions in the rate of wages, and although the men in the iron and some other trades have accepted reductions, it is quite possible that strikes may occur in some trades. There is a considerable amount of agitation going on amongst the numerous employees of the North-Eastern Railway Company here. A large number of men are employed making and repairing locomotives, &c., at the extensive workshops in Gateshead, and also a large number of engine drivers, firemen, and guards are employed by the company. There is no dispute as to wages between the men and their employers, but the manager lately appointed, Mr. M'Donnell, has introduced a new code of rules, and the men strongly object to some of the new regulations. Several meetings of the men have been held lately, and they have recently appointed delegates, who will seek an interview with the directors of the company, for the purpose of stating their case, and having, if possible, their alleged grievances redressed.

DIRECTORY OF DIRECTORS.—To men of business, Mr. THOMAS SKINNER'S Directory of Directors—the fifth annual edition of which that for 1884, has just been issued (Author: Royal Exchange Buildings) has now become indispensable, and intending investors would perhaps do well to consult it when analysing prospectuses, in order to ascertain whether the boards of direction consist merely of guinea-pigs or of gentlemen likely to earn guineas for the shareholders—whether it is probable that the director's name has been bought by the promoters or that the director has bought his shares like other shareholders. The list appears to show that some gentlemen are born to direct, or, as the Japanese put it, "made to order," for on no other assumption can it be explained why they are so largely employed as directors of public companies. Mr. J. W. Batten, a barrister, is referred to as being on the boards of 16 companies; the Hon. T. C. Bruce, M.P., is on the boards of 13 companies; Mr. W. J. Menzies, W.S., is on 11; and many others seem able to render such valuable services that they are equally sought after. As the directory embraces an alphabetical list of nearly 10,000 directors, most readers will be able to find some of their friends placed on the list of honour. The volume appears to be carefully and accurately compiled, and should be generally consulted.

Meetings of Public Companies.

WEST AFRICAN GOLD FIELDS COMPANY.

A general meeting of shareholders was held at the Cannon-street Hotel on Monday,

Commander V. LOVETT CAMERON, C.B., in the chair.

The CHAIRMAN said: Gentlemen, I extremely regret that owing to shortness of money, and many misfortunes, I have not been able to bring you such favourable returns from the Coast as I had anticipated. Still my faith in the value of the property has not abated one iota, and if we can only get capital to work with we may be sure of a good return. As you are well aware hydraulicking by means of a steam-pump was one of the principal features in our proposed method of working. In this I have to report success and non-success, but the former is the greater of the two. I found on my arrival the engine in a very bad state, and much neglected. I had for one day the assistance of an artificer belonging to H.M.S. Pioneer, but we could do no more than get up steam to 20 lbs. or 25 lbs. before leaks showed all round the seating of the cylinder. I afterwards found out all the reasons, but not being able to procure a fitter I determined first to take the engine to the company's property, and there put it to rights. In order to do this, which all save myself declared to be impossible, I had to make roads and bridges, and often had to walk 12 miles in a day, besides attending to the construction of the dam for the reservoir and the camp. I got the roads made and the engine up, and then dismounted the cylinder, &c., completely; I found the piston set by rust in the cylinder, so that it was with the greatest difficulty we could move it; the slide set, so that steam could only be admitted on one side of the piston, and nearly every brass that could be, out of truth or broken. No actual damage had been done to the engine or boiler, and the tubes and fire-box were as staunch as the day they were made. By dint of hard personal labour, making every joint myself, and aligning brasses, &c., I at last got the engine to work well and quietly; so smoothly, indeed, did it work that one could not hear it 100 yards away. By this time my dam was finished, and we had a reservoir of about 4 acres, with a depth of an average of 8 or 9 ft. In this reservoir I built a jetty, on which I placed the engine, and made arrangements to place the pump, and we should have been at work early in July if, unfortunately, a tree had not fallen on the pump (this, I think, was done out of malice) and smashed it to pieces—platform, spindle, standard, and driving pulley were all smashed. Luckily, the shell of the pump was not broken, and I, by dint of hard work and ingenuity, repaired the pump; we had a spare spindle, so that when it was erected it was as perfectly fit to do its work as when it left the factory. Never before having had to do the actual work of fitting machinery, or to work a centrifugal pump, I, of course, took more time than it would have taken if one had had skilful workmen and proper materials. During this time also the erection of flumes, false bottomed and riffled, and the platforms alongside them, was being carried on. To give some idea of the work this entailed, I may mention that over 300 posts of 4 in. and upwards in diameter, running up to 20 ft. in length had to be cut and planted in the ground as supports. After numerous *contretemps* and difficulties I got the engine and pump fairly to work, just before I had to go to Cape Coast to prosecute a man, whom I had employed as head miner, for theft. I found the throw of water did not come up to what I had anticipated, owing to the engine not developing power equal to the amount I had depended on. As every extra pound of steam pressure made an appreciable difference, I believe an engine very slightly more powerful (say) nine nominal horse-power, instead of seven nominal horse-power, would have been amply sufficient. However, by lining up the nozzle, I got a good working jet, which made a decent impression on the hillside. During my absence the engine and pump continued to work well, but I am afraid that owing to lack of supervision working hours and days were very short. When I returned I found, however, that the troughs and receiving boxes were full enough to commence a clean-up. I got things ready, when one of the Kru firemen began tampering with the slide, and I had to take off the slide cover to readjust it. In replacing the cover I strained myself, and was partly laid up some days in consequence. I, after the cover was replaced, ordered steam, it being past 3 o'clock on a Saturday, to be got up on Monday, and went up the hill to see about some other work. At about 5 I heard the engine whistling, and rushing down I found her going full speed, and the pipes pointed right down the troughs. I stopped the engine, but fully two-thirds of the sludge in the troughs and boxes had been washed away. I also lost by this a large quantity of mercury which was in the sludge. I afterwards got the remainder washed up, under most adverse circumstances, and obtained a large quantity of mercury from the blankets and bags under the riffles, but it was all, owing to the presence of arsenic and other substances, so dreadfully floured that scarcely a globule was as big as a pin's head. By perseverance, I got these together, and trying the mercury by some rough tests, the best at my disposal, I thought that the specific gravity was more than that of pure mercury, and I am still of the same opinion, as you will see in the bottle on the table that the mercury is decidedly thick and sluggish, and inclined to deposit some amalgam. So far for the hydraulicking. It is a success in that it proves that water can be obtained in sufficient quantities to supply pumps, which can be made equally efficient with heads of water supplied by gravitation; and when we consider the enormous cost of the water races in California and elsewhere, this method of the pump *versus* hydrant may be considered to have proved itself superior. If I had been able to continue operations, I should soon have arrived at the coating of a diorite reef, which goes into the hill under the dam, and can be seen emerging on the other side a distance of ½ mile or so. This is a diorite reef, and gold should be found in the casing; where it is exposed, this casing is all washed away, and could not be tested, for every sample of soil I took of sufficient bulk showed gold. I had a box, containing 3 cubic feet, made, and wherever near the works (hydraulic) I took a sample. I always found ½ dwt. or 1 dwt. worth of gold, and often 2 dwt. worth, and, of course, in the casing of the reef, it should be much richer. But though erecting the engine and pump took up much time and labour, other work was not neglected. On my arrival I had found nothing done save the erection of a log hut and two wretched shanties, and a partial clearing of the path. Shafts and mining works were in precisely the same condition that they had been left in when I was on the ground a year previous, until the day that I arrived on the ground, then I found some sham work going on about the centre shaft, and a line commenced as a surveying line by a man named M'Millan, which was being cut about as far out from the correct direction as possible. I worked afterwards at the centre shaft, but soon got into water, and though slabbing up and working a rough pump made by my carpenters I could not keep the sides up, and the whole side of the hill caved in. I then drove a tunnel into it towards where one of the trial shafts had been sunk, and we crossed in this tunnel some three or four lodes of auriferous quartzite rock, varying in thickness from 4 to 10 in. Unfortunately, in driving this during the heavy rains, just after we had passed under the trial shaft, the hill side slipped and broke in the roof of the tunnel. I also worked close by the centre shaft for some time both with the long tom and cradle and got some pyrites, which I sent home, and also some of the gold, which was sent home. This should have given me very much better results, but as I was so fully occupied by the engine I was not able to exercise personal supervision, and the man who was in charge committed wholesale robbery. After some little time my suspicions were roused, and I kept a watch upon him, and one day I heard that he had found six or eight small nuggets, which were described as being as big as the top of one's little finger, and one big stone, about half as big as one's fist, which was more gold than stone, and of about 40*l.* or 50*l.* in value, and on another day he was proved to have had 5 ozs. of dust, all he gave me being under an ounce; the total value of gold stolen I believe to be upwards of 200*l.* This man I took down to Axim, and he was committed for trial at Cape Coast, where he was condemned to two years' imprisonment. No doubt besides this one individual there were many others who managed to abstract some of what was found. The piece which was worked by this man turned out to be a rich patch, and had before been very much worked by the natives, and just at the time when I discovered the robbery we came to the end of that portion, but if further works are carried on it may be recovered by following the reef along in either direction. The reef is contained between two walls of chloritic slate, similar to that of which the walls of the reefs in the famous St. John del Rey Mines in South America consist, and the reef itself is a sort of mixture of quartzite, mullock, and gangue, with streaks running through it of a darker colour. Many places have given a large quantity of pyrites. A considerable portion of stone from this reef had been extracted and packed ready for transport to England, when I was compelled to stop work. In the same hill I soon after arrival sunk a shaft and found a reef about 12 in. thick running down, and thickening as it deepened, with many leaders running into it from both sides. This seemed to form the back of another reef running from the end of this portion of the hill which is divided into two at the south end. Besides this there was a solid reef about 2 ft. 6 in. in thickness running as a caunter lode. On this I sunk a shaft, and some of the stone on being tried gave promise of very fair results. The main line of hill, which runs through the whole property and continues to the Ancobra river, is formed apparently by one enormous reef, which must be over 1¾ mile long. The sides of the hill are very steep, and in many cases the road on the top is so very narrow that one can drop a stone down on either side. A short way outside the property the natives, I found, had worked part of the casing of this reef, and they said they had very good results; in fact, I was offered large quantities of gold for sale by some of the people living on the property, which they said had come from that end of the hill, but of which I believe some came off your property itself. I tried in three or four different places, and in all there was a show of gold, but it would have been too expensive to work with the means at my disposal. The River Impima, which runs for a considerable distance through the property, with a very winding course, for some years has been worked by the natives after the rains. The rains have been so exceedingly heavy this last year that water had never been sufficiently low to enable one to get at the auriferous sand, but by diverting the course of the river very large results might be obtained. This would be more fully seen by consulting the plans. If I had had honest workmen I believe that even now I should have brought home such an amount of gold by washing both by cradle and tom, as would have proved the very great richness of this goldfield, but I found it most difficult to get people to work either cradle or tom properly, and immediately anything was found, unless I was actually present myself, it was most probably stolen. Another difficulty arises in the presence, in so many cases, of arsenic and other substances, which prevent an amalgamation of the gold and mercury. I had no sodium or other amalgam to put into the mercury to cure this, and I think it is a question which will arise in the future of all African Mines, that a far better process than that of wet amalgamation with mercury will be found and adopted. The question that arises at present in the goldfields is not: "Is the gold there?" but how quartz found by assay to contain from 2 to 7 ozs. to the ton, and with the machinery now working in some of the mines not to yield above 10 per cent. of that amount, is to be treated to avoid loss. In gold mining in Africa we have a question for the chemist as well as the miner, and with the attentive investigation the subject is now receiving it can only be a very short time before this question will be answered. The dam is 132 ft. long, 8 ft. wide on top, and over 20 ft. high in the centre of the lower side. The dam is founded on a reef, and the centre consists of a double row of piles filled in with clay, puddled and rammed, and in the centre hurdles are placed and also puddled up—the clay for this had to be brought nearly ¼ mile. This core has been covered with earth well rammed, and on the lower side heavily revetted with dry stone from 6 to 10 feet thick to give it weight and strength. An overflow gate has also been made. There are over 2000 cubic

yards in the dam, which at English contract rates, 4s. 6d. per yard for moving alone, would cost 450*l.*; of course, for building, &c., it would be double or treble that. There were 3 miles of road to be made and temporary bridges. The greater part of the property has been surveyed and laid out, and delimitation lines cut. There are houses fit for occupation by three Europeans, one 20 ft. by 12 ft., and the other contains two bedrooms, each 12 ft. by 9 ft. with a centre hall, 12 ft. square: one is mostly plank and the other all plank—doors, windows, bolts, verandahs, &c.; earth floors, hard rammed, with coal tar and charcoal laid in below the top layer: necessary offices, clerks' houses, and houses for labourers (Krumen), and a range for native artificers. These latter houses are fit, with little alteration, for European artificers, and are even now as good as some inhabited by white men. This laying out of the camp, and the necessary clearing and sanitary arrangements, took a great deal of time and attention. The jetty was 14 ft. wide by 30 ft. long, and as far as the engine stood, stone, confined by logs, and filled in with clay. Besides the other houses mentioned an iron house was erected in the camp, a wooden house made and placed in a pit for the magazines, near the flumes there was put up a wood storehouse with iron roof, and close by the engine was a wooden house for the firemen and tools in daily use—also a large shed for carpenters and smiths—also various trial pits and cuts. The Chairman then stated there were the following lodes, &c., on the property:—Main reef in line of Apatim Hill. In spur ditto, some four or five seen. Bujia Valley. Across Ida stream, and under Invicta hill. In hill on which Ehin Kru stands, and many others which cannot be shown until map is completed. Impina river flats should prove very rich. Fetish ground not yet worked, drains to Ancobra, people still afraid to work there. In conclusion, the Chairman moved the addition of the report and accounts.

Mr. SHERIDAN: What is the actual sum required to develope the property?

The CHAIRMAN said he thought that with 10,000*l.* they would have sufficient to send out some small stamps, and provide other things sufficient to show results.

Mr. SHERIDAN asked what returns 10,000*l.* would make on the capital?

The CHAIRMAN said assuming they worked 200 days in the year crushing 30 tons a day, with a yield of ¾ oz. per ton, he calculated roughly that would yield sufficient to pay about 12 per cent on the capital. Then there was the unpaid purchase-money, and if that were taken into consideration it would reduce the amount.

Dr. SUCKLING thought the reports ought to inspire the shareholders with confidence, but the shareholders wanted some properly-considered recommendations brought forward by the directors—something of a more solid and substantial character—to enable them to come to a right conclusion. A report should have been sent out before the meeting.

The CHAIRMAN said that when he was out there he worked like a navvy in the face of the greatest obstacles and difficulties. Considering the men he had, more work had been done in the same time than had ever before been done on the Coast. The engine had to be first moved up, and in order to enable that to be done large boulders had to be removed, and, in fact, a road made. He had worked hour after hour in a climate where most men would not go for 1000*l.* He had every kind of fetishism to contend with, and when he took the man down to Cape Coast for trial on the charge of gold stealing the witnesses were tampered with, and every obstruction thrown in his way. He received 150*l.* for going out, which did not pay his expenses, nor anything like it.

Mr. CLENCH said that what the shareholders wanted was a clear financial statement; they wanted to know what money was required, and what money was expended, and also to ascertain whether further money would be of any service.

Mr. FORSTER said the shareholders were fully impressed with the hard work which Commander Cameron had performed, but what they had heard was rather a diary than a report from the directors. The shareholders expected to have had some policy expounded, and also what were the present position and future prospects of the property.

Mr. STEWART (a director) said that the Chairman only arrived home on Feb. 2, and since then had been suffering from fever and ill-health. There was no mine on the Coast so well situated for working so cheaply. What broke their necks was the useless character of the first batch of men who went out. The directors were very much disappointed that there were no better returns. He believed that if the shareholders put their shoulders to the wheel, and with proper management, and with the board strengthened, they might have good returns in a short time. (Hear, hear.)

Dr. SUCKLING said he had no doubt there was sufficient gold, but some definite policy must be placed before the shareholders.

The CHAIRMAN said that since his return he had been suffering from fever, and had no time to look into things, or go into financial matters.

A SHAREHOLDER asked who was now manager at the mine?——The CHAIRMAN said no one.

A SHAREHOLDER said he was afraid the difficulty with regard to the stealing of gold would continue.

The CHAIRMAN said when he was there he was alone, and it was utterly impossible for one man to exercise a proper supervision. When he got out there the engineer in charge was dead, and the other man sent home, and what had been done had been done by himself alone without a single white man to help him, and with people throwing every obstacle in his way. If there were a European staff the gold would not be stolen. He tried to do the best he could for the shareholders.

Mr. SHERIDAN said the shareholders had no cause of complaint against Commander Cameron. (Hear, hear.) What they wanted was more definite information, and he moved that the meeting be adjourned for a few days, in order to enable the directors to strengthen the board and take counsel with some one, and then come before the shareholders with a definite policy, so that they might know what was best to be done.——Dr. SUCKLING seconded this amendment.

Mr. WALKER said it must be done before March 29, or the company would have no property left.

After some discussion the resolution was, with the full concurrence of the Chairman and directors, put to the meeting and carried, and a vote of thanks having been passed to the Chairman the meeting terminated.

VICTORINE GOLD COMPANY

A special meeting of shareholders was held at the Cannon-street Hotel on Wednesday,—Mr. ALBERT RICARDO (the liquidator of the old company) in the chair.

The CHAIRMAN said—Gentlemen, as liquidator of the old Victorine Company, it falls to my lot to take the chair. You will remember at our last meeting my friend Mr. Pope explained to you exactly the state of our affairs, and advised you to change your bonds into shares to make a small bonded debt so as to raise sufficient funds for carrying on what we are more impressed than ever is a good concern. (Cheers.) You came to the conclusion that you would agree with what Mr. Pope said, and we passed a resolution undertaking to do so. We have been before the Court, and they require another meeting, which is the one we have to-day to confirm the resolution. The agreement shall be read to you, and a resolution will be proposed, and I have no doubt you will confirm what was agreed to at the last meeting. If there are any explanations which any gentleman requires who was not present at the last meeting, I am sure my friend Mr. Pope, who has kindly accepted the chairmanship of the new concern, will explain to you, as he did at the last meeting most lucidly, exactly the state of the agreement.

Mr. HARRISON (of Messrs. Morgan and Harrison), solicitor, read the draft agreement.

Mr. TURNER: What is the value of the plant and machinery?

The CHAIRMAN said it was difficult to give a value. The plant cost 25,000*l.*, and he trusted it would be very valuable shortly.

Mr. TURNER: In what way?——The CHAIRMAN: The stamps and other things will come in; they are erected and ready to go to work.

Mr. POPE, Q.C.: There has been a large amount of money spent in building, machinery, and exploration which would be available in the event of the thing being taken as a going concern, but which, as a breaking-up concern, would be almost valueless.

Mr. TURNER asked whether during the past month there had been any *bona fide* offer for the property?——Mr. POPE, Q.C., said there had been a rumour of an offer, but not a *bona fide* offer. A rumour reached the liquidator that an offer might be made, but Mr. Guinness, on making enquiry, came to the conclusion that it was nothing but a bogus offer, and nothing more was done with it.

The CHAIRMAN: It was an offer made in the hope of selling it for 10,000*l.* more; but the man who offered it was not an actual buyer except he was a seller at a profit.

A SHAREHOLDER asked whether the stamps would crush 30 or 60 tons per day?

Mr. POPE, Q.C.: Thirty heads of stamps are calculated to crush 60 tons per day.

The CHAIRMAN: The agreement stripped of all legal verbiage, is that the old shares should be wiped off, and that the company should receive shares instead of bonds; that the new company should be formed with a capital of 160,000*l.* in shares, and 30,000*l.* in bonds. That 100,000*l.* bonds will become 100,000*l.* shares; you will have nothing before you but the 30,000*l.* The 30,000*l.* 8 per cent. are to be offered to you in the first place, or to your friends, and even to the public if you do not take them. But the 30,000*l.* are to carry 30,000 shares with them. The present bondholders will receive fully paid-up shares in lieu of the present bonds, and shares for the interest due. That is the scheme, and I think that with the prospect before us, and the accounts from the mine, the 30,000*l.* first mortgage bonds will have a security which any man might think, as far as my impression goes a good security; in addition to which they will have an interest in the mine to the extent of their bonds in fully paid-up shares.

A SHAREHOLDER: Is the 30,000*l.* in shares included in the 160,000*l.*?——The CHAIRMAN: Yes; it was made 160,000*l.* in order to have 30,000*l.* as a tempting offer to the present bondholders.

Mr. POPE, Q.C.: I will move the resolution, and will say a word or two more upon the scheme, as there may be some bondholders who were not present on the last occasion, and did not hear exactly the explanation I gave. The position of the bondholders is that of mortgagees in the present possession of the property, and all they could hope for, even if they were able to enforce their bonds, is to take possession of the security which they have—to get the mine. The effect of this scheme is to give to the bondholders the property as a security for their bonds; in other words the liquidator and trustees for the old bondholders convey to the new company the whole property in the mine, and the scheme divides that property by means of shares amongst the bondholders, so it puts them exactly in the position of mortgagees who foreclose upon the property. If the property is worth what we think it is, and is a good security, and if the property could be sold the simplest way, no doubt, would be to sell it and divide the money. But the property cannot be sold unless some other company were formed with the view of taking it up, and, if so, we may just as well be the company. (Hear, hear.) Then comes the question—How is the mine to be profitably worked when we have got it into our own hands? Upon that point you have Mr. Rueben Ricard's report, and also those (to which I attach more importance) of Prof. Price and Mr. Cecil Guinness, who went out at the instruction of the directors to ascertain how matters stood, and who in the course of doing the work which was necessary, in order to satisfy the Government title—for as you know on all claims not absolutely patented the Government require a certain amount of work to be done every year, and certified in the State Register as having been done—in order that we might not lose the title, and not lose the property altogether, we sent out Mr. Guinness. The directors arranged with myself to furnish the necessary funds, and we did the necessary amount of work, and had it registered in the Government office all complete, so we have the title for another 12 months, until we have time to get the scheme through. In the course of that investigation Mr. Guinness reported that he came upon most valuable indications of ore.

Mr. TURNER: It is not Mr. Guinness' opinion only?—Mr. POPE, Q.C.: No; but Prof. Price's as well, but Prof. Price has not visited the mine, and all that Prof Price certifies on his own responsibility is the quality of the ore submitted to him, and Mr. Guinness certifies that the ore which was submitted to Mr. Price was the ore which he himself saw extracted from the workings we were engaged on at the time. I do not pretend to say that this is a mining venture without risk, no mining venture can be without risk, but it is a mining venture with as good a prospect as any I know of, except those in actual working, and making profits. We are in this position as bondholders; if we carry out this scheme we have the property. How is it to be worked so as to become a paying property? If it become a paying property we are better off than as mortgagees, because if it comes to be a mine after this scheme is carried out we are bondholders and shareholders too. According to the estimate which has been given us by Prof. Price and Mr. Guinness, I put aside for the moment Mr. Rickard, because our more recent information is from Prof. Price and Mr. Guinness, and according to that if we can raise a sum of 30,000*l.* we can clear the whole concern of debt, and we can have the property clean in our own hands, with a sufficient sum to give us every prospect of being able to develope the mine to such a profitable point that capital is no longer a matter of difficulty at all. On the other hand, when we were here last time some of the bondholders thought that if they took the property and divided it into shares, there ought to be a limit, at all events, to the power of the directors to pledge that property for any capital. Therefore, the limit is 30,000*l.* The security which is offered for that 30,000*l.* is, first, the property itself, with the machinery and plant, and all its rights and benefits; and, undoubtedly, if the mining property is worth anything like what we anticipate, it certainly is a good security for 30,000*l.* (Hear, hear.) But, if we are in possession of this property, it will require some temptation to induce people to put their money in it, therefore, we propose, first of all, that the mortgage debt should bear a preferential rate of interest of 8 per cent.; and beyond that 30,000*l.* bearing 8 per cent. all the profits of the mine would be divided amongst the shareholders—that is, amongst the bondholders. But still 8 per cent. on the mortgage of a mine in such a position appears to be a security which, excepting to those interested, would hardly be good enough to tempt. The bondholders have been tried, and as far as they are concerned, except for some small share of them, they appear to be either unable or unwilling to assist, and we must look outside the bondholders. Therefore, there must be some additional temptation. It is proposed to issue the 30,000*l.* on mortgage bonds, bearing 8 per cent., and there is a further inducement that these mortgages shall have allotted to them fully paid shares in the undertaking to the extent of that subscription, so that those bondholders become shareholders with us in the future profits of the mine, and receive also their mortgage security at 8 per cent. Of course, it will be for you to decide, but we hope that it will be sufficient to induce so moderate a subscription as 30,000*l.* It is not a large amount to ask for, but we hope it will be enough. If we get 30,000*l.* we clear the company of debt, transfer the whole property to the bondholders, and get a sufficient amount of capital to develope the mine in 12 months if we could raise that money. Of course, we can only express an opinion. I am only able to form an opinion from such facts as are laid before me. I have very little doubt that if we could raise that money in 12 months, it may be, we should have a most valuable property, and we should find ourselves in the position of having our shares at par. This belief is largely shared by Mr. Jenkinson, who is largely interested in the property, and has had opportunities of forming a better opinion than I have. I earnestly recommend you to sanction the scheme, and as far as you can to assist the directors in raising the 30,000*l.*; and if we do that I believe the next meeting will be one of congratulation rather than of arrangement for the purpose of getting rid of difficulties. (Cheers.) In conclusion Mr. Pope moved the approval of the agreement submitted to the meeting.

Mr. JENKINSON seconded the motion, and said he entirely corroborated all that had been said by Mr. Pope regarding the value of the mine. He never had had the slightest doubt of the value of the property. No one had ever ventured to say the property was a bad one.

Mr. POPE, Q.C., then proceeded to read extracts from a report of Prof. Price, the effect of which was that from all he had heard of the mine it was an exceedingly valuable property.

After some further discussion of an unimportant character, the resolution approving of the agreement was then put to the meeting and carried unanimously.

The CHAIRMAN pointed out that it was absolutely necessary, in order to carry out the scheme, that the gentlemen should come forward and subscribe sufficient funds to enable an appeal to be made to the shareholders and to the public also.

In response to this appeal several gentlemen came forward, and put their names down for different amounts.

The meeting above reported was a meeting of first bondholders; a meeting of second bondholders was afterwards held, at which precisely the same resolution was passed approving of the scheme.

A cordial vote of thanks to the Chairman and Mr. Pope, Q.C., closed the proceedings.

MID-DEVON COPPER MINING COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Finsbury Pavement, on Wednesday,

Mr. THOMAS NICOLLS ROBERTS in the chair.

Mr. W. H. RICHARDS (the managing director) read the notice convening the meeting. The report and accounts were taken as read.

The CHAIRMAN said: Gentlemen, before moving the adoption of the report, I wish to offer a few observations, although we have made it so explicit that little need be said, as both the report and the accounts are sufficiently clear for anyone to understand them. It will be observed that we have sold ore to the amount of only 293*l.* 6s., as against 696*l.* 15s. 3d. in 1882; but, as we have previously explained, four months were lost in getting the rock-drills to work, through the failure of the machinery designed by the engineer. Had this not been the case, the parcel of ore sold last month, and that which will be sold next month, would have appeared in the accounts for 1883. You will gather from the report that we did not feel justified in confining our operations to the 50 fm. level, as the indications there were not sufficiently favourable; and, from what we could see at that point last October, there was no inducement to drive the 60 fm. level, as that, whenever it is driven, will cost 450*l.* in dead work before we can expect any return from it; and although, within the past fortnight, there are unmistakeable signs of the ore making downward from the 50 fathom level to the 60 fathom level, we are convinced that we have done the right thing in sinking our way to the 100 fathom level. For what is our object? We wish to bring the mine into a dividend-paying condition as soon as possible, and we fear that will hardly arise from the upper levels, although those levels have been more productive than similar levels in the great proportion of mines in Devon and Cornwall. The reports of all the experts who have inspected the mine, and the statement of your own mine captain made in this room last August at the half-yearly meeting of shareholders, agree in the belief that as we sink deeper so we shall develope greater riches. And this view is borne out by the experience of other successful mines in Devon and Cornwall, while the mines in these counties that have paid dividends from shallow workings have been very few in number, and beyond all question the deepest mines have been most productive. I believe the experts and Capt. Neill are right, and that when we have reached 100 fathoms, driven a level there, and fully developed it, we shall all be repaid for our weary years of waiting, most of which were frittered away, no attempt being made fairly to grapple with the work. That the rock in the shaft has hitherto been of a compact and unyielding nature is our misfortune, but not our fault, for had it been easier we should at this moment have been 93 fathoms down instead of 69 fathoms; but it will be contrary to general experience if this hardness is continued much deeper than the point we have now reached; be that as it may, we can only overcome the passive force of Nature by hard work. You will observe that we are, and have been, doing all the work that appertains to a board of directors without payment. We make no merit of this, as we are endeavouring as shareholders to save ourselves as well as you, and I believe that many mines in this kingdom are prevented from being brought to a successful issue by the mere cost of administration; and that was the case with this mine up to the end of March, 1882. It is true that no fees were paid to directors, but the establishment expenses were out of all proportion to the work that had to be performed. But there is another cause of non-success in mines, and that is the payment of royalties out of capital, which is most inequitable, as such payments should only be paid out of profits. There is now no more certain way of strangling mining enterprise than the present unjust system, whereby the men who subscribe their money to do the work, and, who, therefore, virtually do the work, get nothing, while the man who does nothing takes a portion of their subscriptions. Owners of the soil would find that a policy of justice—or of generosity if they like the word better—would be ultimately more conducive to their interests than an insistance on their full legal rights. It would lighten the labours of many mining companies if they could be spared the payment of royalties until they had got through the trying periods of dead work, and had reached the period of development. On the other hand, boards of directors, or committees, or by whatever name the management might be called, should show the landowners that the costs of administration were kept to the lowest point compatible with efficiency, otherwise the landowners might say, and with fairness too, "Why should we forego or postpone the payment of our royalties in order that you gentlemen may regularly receive liberal fees?" Of course, there are many mining companies to the management of which these remarks do not apply; but it is notorious, and the practice has been animadverted upon again and again in the *Mining Journal* and in the Mining World, that directors take their full fees year after year, while the unfortunate shareholder gets nothing, in fact, his position, between the upper millstone of the administrative body and the nether millstone of the owner of the soil, would not be very accurately described as a bed of roses. If the latter would postpone their claims, and if the former would abate their pretensions, until mines had arrived at a paying or even a self-supporting condition, the old industry of mining would take a new departure, and thousands of persons who now avoid mines as they would avoid a pestilence, would enter into the business with the same spirit and confidence that they enter into other enterprises. I have been induced to offer these remarks because in December last we had rather more than sufficient money to meet our monthly payments, when down came the demand of the lessor for his royalty, the amount of which I had to advance from my private resources. This brought the matter home to me very closely, and I determined that, at the first opportunity, I would give my views on the question, not only of royalties, but also of the administrative charges in connection with mines. We can speak with clear consciences upon the latter point, as we have economised in every practicable way, and have subordinated everything to a vigorous prosecution of the work at the mine. We court enquiry, and any shareholder may inspect the accounts in detail by calling here on Mr. Richards. I beg to move the adoption of the report and balance-sheet, and shall be happy to answer any questions that may be put forward.——Mr. JOHN GOULD seconded the motion.

Mr. REEVES said he was very sorry that he could not adopt all the views put forward by the board and by the Chairman. No doubt if they paid no royalties nor rents it would be very much better for the shareholders; as it would also be if the debenture-holders and the gentlemen who had received the large amount of interest which appeared in the balance-sheet would also forego their demands for the benefit of the shareholders. [Mr. F. J. WILSON: Hear, hear.] This was, however, the proverbial herring which was drawn across their path to take their attention from the serious position of the company. The shareholders were told in 1882 that the non-success of the company was due to the want of harmony at the board; but for the past two years they had had a united board, and what had been the result? In the first place they had abandoned the policy advocated by Mr. Wilson, Mr. Martineau, and others of searching in the 45 and other of the upper levels. Why had that operation been abandoned? He also wished to know why it was that the drivage for which the money recently raised was subscribed had not been proceeded with? They were now told that it would take so much money to reach profitable ground that the work had not been done. He charged the directors with being inconsistent and incapable. They had spent 1639*l.* in rock-drilling machinery, which was now admitted to be utterly useless. (No, no.) The Chairman had made a great point of the fact that the present directors had taken no fees, and upon that fact they based their claim to a reduction of the royalties; but their predecessors had also refrained from taking any fees, so that they were not exceptional in that matter. Then, a great deal was made of the promise made by the directors that the money subscribed had not been "wasted in high rents, high salaries, and extravagant travelling expenses;" but what great economies had been effected? A saving of about 100*l.* a year had been made; but against that they had to put the fact that the company had an office in an out-of-the-way place, which was only open for a couple of hours a day. The ordinary shareholders could have very little hope of the future of the company, which was practically being carried on for the debenture and preference holders. He moved as an amendment that "the report and statement of accounts be not received and adopted."

Mr. F. J. WILSON seconded the amendment, and in doing so said that as the next largest ordinary shareholder to the Chairman he had taken very considerable interest in the progress of the mine. He generally agreed with the remarks of Mr. Reeves, and said he had urged from the first that it would not be good policy to incur a heavy expenditure in rock-drills, and he had always strongly advised that the upper levels should be worked. Had this been done he did not believe that either debentures or preference shares would have been needed. He said to the credit of gentlemen that the Chairman had always had great faith in the mine; but that was no reason why he should have imported into the direction of the company men whom nothing but ignorance and overweening vanity could ever have forced into the management of an industrial enterprise. The result, as shown in the report, was that money had been thrown away, and that the points which would have carried on the enterprise without fresh capital having to be raised had been left untouched. He contended that the direction had been inefficient, and that there had been a great want of energy displayed in carrying out the development of the enterprise.

The CHAIRMAN, in reply to Mr. WYLDE, said that the office work was being properly done, and that a considerable saving had been effected under the present direction.

Mr. WILLIAM HALL said he could well understand that persons smarting under a feeling of disappointment should attack those who were directing the company which those persons had neither the ability nor the desire to serve; but he was really surprised that such an attack should come from Mr. Reeves, under whose care the books of the company had disappeared at a very convenient period. The books were worthless to anybody, but though a large reward had been offered for their recovery, they had never been seen. For his own part, he believed that the books were incapable of being found 24 hours after they left the late offices of the company; and, therefore, it was impossible to criticise fully the actions of those who then had charge of the affairs of the company. The directors had deemed it wise not to confine the whole of their attention to the upper levels, as they believed that if the mine was to be really profitable it would be in depth. He had recently spent two or three days at the mine (not at the expense of the company), and he had been pleased to see that everything was going on satisfactorily and for the advantage of the shareholders. They now had a united board, who were doing all they could for the company, and he had full confidence in the board as now constituted—though he and his colleagues might be ignorant, vain, and incompetent, as their opponents had stated. He had been connected with companies for 30 years; but he had never brought an undertaking into such a position as this company was brought into by Mr. Wilson and his friends. He (Mr. Hall) would support the Chairman by all the means in his power when these impudent and audacious attacks were being made on him. (Applause.)

Mr. RICHARDS said that at times the upper levels had paid; but it had been in a fitful manner. As a matter of continuous working they had not paid.

After a few additional remarks from Mr. REEVES and Mr. WILSON,

The CHAIRMAN said that the debentures were created by the Belston Company under the direction of Mr. Wilson, whose only ground of complaint was that the present company was honest, and paid the interest on its debentures. As to the preference shares, the capital was wanted, and it certainly would not have been subscribed upon ordinary shares. As to the office accommodation, he could say with truth that Mr. Richards was more often to be found at the present office of the company than Mr. Reeves or anybody else at the old offices. It was incorrect to say that the upper levels would pay the expenses, for the 45 had long ago given out to such an extent that it would not pay to work it by men receiving weekly wages, and there were no tributers in the mine. He would give more for the opinion of Capt. Neill than for the opinions of all those who were previously connected with the mine, and the belief of Capt. Neill was that in depth they would be able to earn good dividends, and those would never be earned in the upper levels. He was ready to admit that the rock-drills had cost more than had been expected; but they had relied on the opinion of Mr. Matthew Loam, who was second to no mining engineer in the world, that the cost would not be more than 910*l.* The drills had been of great use in driving, but in sinking they had not done so well; but that was the experience of most other mines. They had had to deal with exceedingly hard rock, and the drills would continue to be of the utmost assistance in the future drivings.

The amendment on being put was lost by six to three, and the original resolution was adopted.

The CHAIRMAN then moved, "That the directors be requested to go carefully through the various leases or setts of the company, and upon such terms as the directors may seem fit, to determine or surrender such of the said leases or setts as it may seem to the directors advantageous for the company to determine or surrender."——Mr. HALL seconded the proposition, which was carried after a short conversation.

The retiring directors—Messrs. T. N. Roberts and W. H. Richards—were re-elected, and Mr. P. M. Evans was re-appointed auditor.

The meeting closed with a vote of thanks to the Chairman.

PARYS COPPER CORPORATION.

A general meeting of shareholders was held at the offices of the company, Finsbury-circus, on Tuesday,

Mr. J. Y. WATSON, F.G.S., in the chair.

Mr. FELIX F. WILSON (the secretary) read the notice convening the meeting. The directors' report was taken as read.

The CHAIRMAN said: I think the better way would be for Mr. Wilson to read you the correspondence which has taken place with respect to the actions for alleged breaches of covenants.

Mr. WILSON then read the correspondence which has taken place between the solicitors of the company and those of the landlords, Lord Sydney (trustee for the Marquis of Anglesea) and Lady Neave, on the subject of the action.

The SECRETARY, in reply to a question, said each of the original lessees, the assignee of the lease, and both the Parys and Morfa Du Companies had been made defendants in the actions which had been brought.

The CHAIRMAN: I will add just a few words to what is stated in the report. We have sold since the commencement of the old company ores to the value of 79,391*l.* 12s. 8d., and have spent on the mines 90,000*l.*, and we have paid the lords 5000*l.* in royalties for land worthless for anything except mining. For some years we spent large sums of money in driving a level 30 fms. under the great open cast, which had yielded 5,000,000*l.* sterling to the Marquis of Anglesea and Lord Dinorbin. This experiment had never been tried before, and had it turned out as well as we all anticipated it would not alone have been a grand thing for the shareholders but for the lords also, and during this work we spent at least 30,000*l.* on the mine. At this time also copper ore dropped more than 2*l.* a ton, rendering it impossible to raise and sell the poor ores without great loss, and we had to stop some of the raisings. Then the lords came down upon us all at once for breaches of covenant, and claim 5000*l.* damages, and this, too, when most mining lords both in Cornwall and elsewhere are assisting their lessees both in reduction of royalties and remission of arrears. In October last, as you are aware, we were ready to amalgamate with the Mona Company—a remedy which would be a great advantage to the shareholders and to the lords also; but at every attempt to carry out this arrangement we seem to have been met by legal obstruction and costs. The lords entered the case for trial soon after the last meeting, and it was not until Jan. 1 that any terms for settlement were offered to us. In the meantime it has cost us more than 1000*l.* to keep the mine going, as we were compelled to do, and during this time legal costs have been run up to the extent of something like 700*l.* With reference to the amalgamation, we have letters here from the managers of the Mona Company, which satisfies us that a very large profit might be made.

The CHAIRMAN, in reply to questions, said the Mona was an entirely distinct property, and the company had large smelting works. In order to effect the amalgamation the company would have to be wound up and reconstituted. They wanted a new lease instead of going on on the present terms for the remainder of the period—about seven years—that the lease had to run. They also asked for a reduction of the royalty, and for the power to reduce the costs. Mr. Evans had made careful calculations, and he was confident that the amalgamated companies could make a profit of 10,000*l.* a year.

After some further conversation, the Rev. A. COOPER proposed "That the directors be requested to covene a meeting to pass the necessary resolutions to wind up voluntarily, and to appoint Mr. F. F. Wilson liquidator, with power to arrange terms, and to sell the property to the new company, which it is proposed to form to work the Mona, Parys, and Morfa Du Mines."

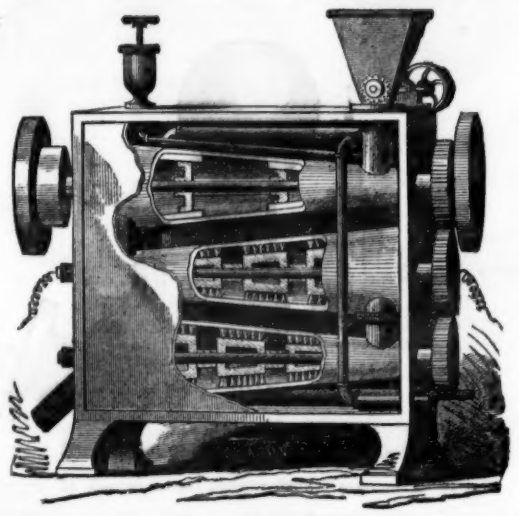
Mr. WAGSTAFF seconded the proposition, which was carried.

A cordial vote of thanks to the Chairman was passed, the meeting closed.

NOVEL ELECTRO METALLURGICAL MACHINE.

PROFESSOR JAMES MANES AND SONS call the attention of miners, mineowners, capitalists, and others interested in the working of gold or silver mines to their new Electro Metallurgical Machine for extracting fine and rusty gold from sands or tailings of stamp mills, or the sands of hydraulic gold diggings, or from the black sands on the coast of Oregon or California, and other parts of the world where gold is found.

The problem that has long troubled the worker of free-milling gold and silver ores is a method to save the mineral now lost in the tailings of stamp mills or flumes. This alone, if it could be saved, would amount to many million dollars profit each year, besides enabling the working of much territory which is now lying idle for want of an economical and thorough process of treatment.



Prof. James Manes and Sons, of Denver, Colorado, U.S., have invented a machine (represented in the above engraving) which it is claimed will save nearly the entire amount of mineral which passes through it, the loss not being over 10 per cent., and in many cases not in excess of half that amount. The machine is a cheap and practical process—it never need stop for charging or cleaning up, being nearly self-acting. Steam, electricity, and mercury are used in the process of extracting the mineral.

This machine or amalgamator is adapted for free-milling gold or silver ores, or refractory after roasting. It consists of a series of three or more large cylinders, wider at one end than the other, placed one above the other in a horizontal position, a shaft or spindle running through the centre of each.

The ore and mercury are fed into the first cylinder, passing into the second, and then to the third. The first cylinder is furnished with steel muilers which nearly touch the sides of the cylinder, and revolve at a good rate of speed, mixing the mercury and ore. The second cylinder is furnished with large steel brushes attached to the shaft or spindle, revolving at a high rate of speed; through this a current of electricity is furnished by a Westinghouse dynamic electro machine, which materially assists in gathering the particles of very fine gold together, and thoroughly amalgamating the metal and mercury. The third cylinder is similarly furnished to the second; into this the amalgam passes, and is again acted upon and mixed by the brushes to catch any gold which might have escaped amalgamation in the second. A fourth cylinder may be used if found necessary.

The amalgamated pulp then passes through a revolving copper drum, plated with quicksilver inside. As the drum revolves it takes up the most part of the amalgamated gold. As the inside of the drum is constantly washed with a spray of water from perforated pipes fixed inside of said drum, a clean-plated surface is constantly brought in contact with the pulp or tailings as it passes out from the cylinders. After leaving the drum it falls down on to incline copper plates, the same as is now used in stamp mills.

The amalgam can be collected from the drum and plates without stopping the machine, and any live quicksilver that passes will be caught in syphons. The tailings are carried off with the water. The machine when attached to the flume will be driven by the waste water; it sifts the fine sands from the coarse gravel, and amalgamates it as above.

The specific points claimed by Prof. Manes and Sons in their patent are—

1.—The saving of almost all the mineral passing through the machine.

2.—The loss being less than 10 per cent.

3.—The entire absence of loss of the amalgamated material, thereby saving all the mercury, which, with the processes now in use, there is a large loss both of mercury and the precious metal.

4.—The small cost per ton at which the ore can be treated.

By the addition of the powerful current of electricity that passes off the revolving brushes, the most minute particles of gold will be caught and retained, which in the ordinary flume and stamps passes off with the water; this often amounts to a large percentage.

The inventors state that if English stock companies will give their assistance to work the black sands of Oregon and California by paying for the building of the machines, they will take a share of the gold for their services, or they will send their machines to any part of the world, or will sell patent rights to those desiring any of their patent machines or revolving furnaces for roasting or melting ores, ball pulverisers, &c.

Prof. James Manes and Sons are agents for the Morey and Sparey Ball Pulveriser, that crushes and pulverises at the same time, and does as much work as eight stamps in a day, crushing either wet or dry.

PRINCIPAL OFFICE OF

Prof. MANES and SONS,

No. 9, Windsor Block, Denver, Colorado,

U.S.A.

All our machines and furnaces are made by the Colorado Iron Company of Denver, Colorado, the most extensive mining machine works in America.

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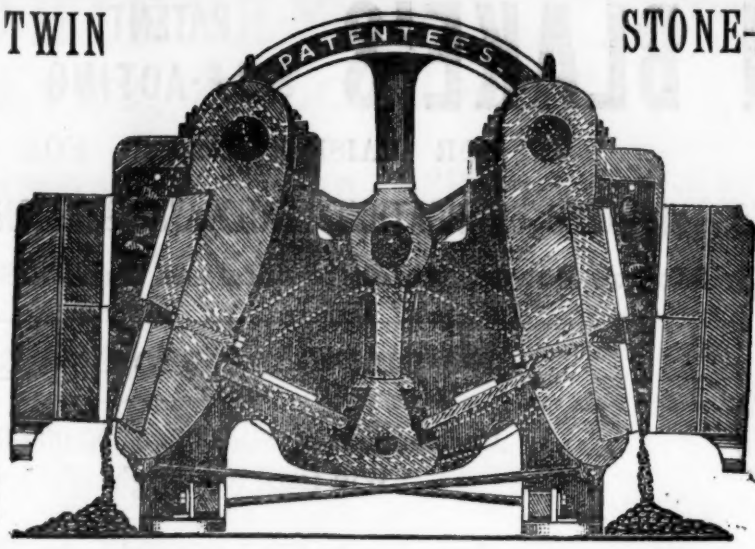
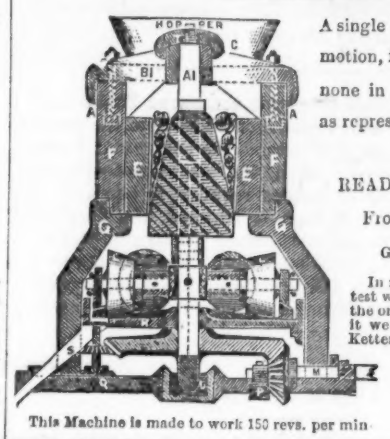
A few advantages of the Twin Stone and Ore Breaker over all others:—1st. It utilises the waste power known to exist at the back of the single machine.—2nd. It will do twice the work of any other.—3rd. It takes no more power to work it, as the stone at one end helps to break the stone at other.—4th. You can either use one or both ends.—5th. The price is no more than others ask for single machines.—6th. It has double cushions in Pitman, so as to break small or large sizes.—7th. You can break, if wanted, small at one end and large at the other.—8th. By putting one toggle plate in top groove of one side of pitman, and the other in bottom of the other side, it gives a rocking movement, so that it cracks the stone and makes it in a more cubical shape than any other in the world.





This Machine is made to work 150 revs. per min.

A single 12 by 7 Stone Breaker, with crushing motion, for £45. Guaranteed to be second to none in the World. Money refunded, if not as represented, one month after delivery.

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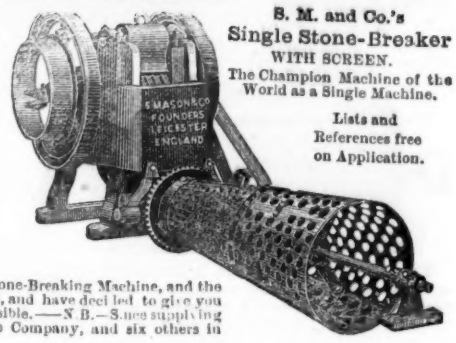
In reply to yours regarding our inspection of Stone-Breaking Machine, and the test with you and Baxter's we think yours the best, and have decided to give you the order. Please to get us a 20 by 9 as early as possible.—N.B.—Since supplying it we have received orders for another from the Company, and six others in Kettering and the district.



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WITH SCREEN.
The Champion Machine of the World as a Single Machine.

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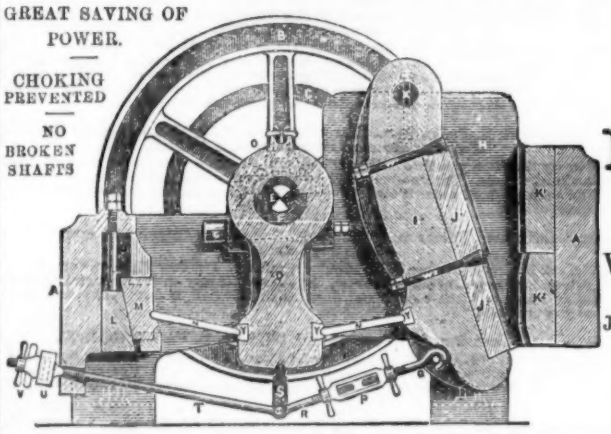

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Patent Improved BlakeStonebreakers and Ore Crushers,

With PATENT DRAW-BACK MOTION,

WHICH DISPENSES WITH ALL SPRINGS.

JAWS adaptable either for CUBING or CRUSHING.
Reversible in Four Sections, with Surfaced Backs.
Steel Toggle Cushions.

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SEND FOR A PRICE LIST OF

JOHN BLAKE'S PATENT SELF-ACTING HYDRAULIC RAMS,

FOR RAISING WATER FOR THE SUPPLY OF

TOWNS, VILLAGES, IRRIGATION, RAILWAYS STATIONS, MANSIONS, FOUNTAINS, AND FARMS.

No Cost for Motive Power, which is obtained from a Stream of Water passing through the Rams.

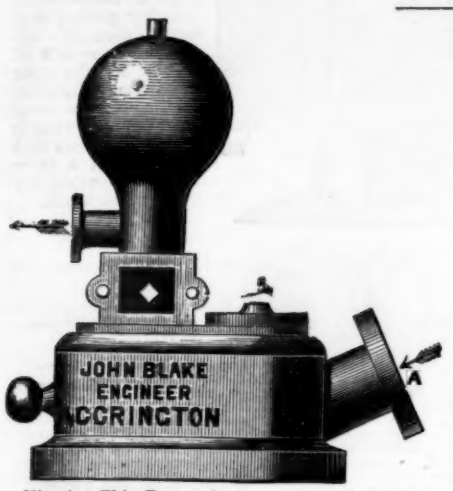

Fig. A.—This Ram raises a portion of the same water that works it, and a special one, on this principle, can be supplied at extra prices to force to a height of 500 ft., and by a second Ram to a height of 950 ft. The patterns vary with the different sizes.

NO OILING OR PACKING REQUIRED.

Made in Sizes to raise 300 to 500,000 Gallons per day.
Will force to a height of 1500 feet.

Special Rams for High Falls to send up Two Gallons out of every Five Gallons passing through them.

*** ESTIMATES WILL BE GIVEN ON RECEIPT OF THE FOLLOWING PARTICULARS:—First, the fall (in feet or inches) which can be obtained from the stream, spring, cistern, or other source of supply; second, the height and distance to which the water has to be forced; third, the approximate quantity falling per minute, and the number of gallons required to be raised in a day of twenty-four hours, and if a B Ram is required, the depth and horizontal distance from the Ram to the clean water should also be stated. Gun metal is liberally used in the construction of these Rams, and the prices include gun metal foot and stop delivery valve, &c. They are fitted up in a most substantial and workmanlike manner, the first cost being only a secondary consideration.

Fig. B.—This Ram whilst worked by a stream of impure water will pump clean water from a well or spring. Rams on this principle can also be supplied to force to a height of 1500 ft. Patterns vary with the different sizes.

PRICES OF RAMS OF FIGURE A MAKE TO FORCE TO MEDIUM HEIGHTS.

No. of the size of the Ram.	Number of Gallons per day of 24 hours, the Ram will raise where there is sufficient working fall as compared to the height the water has to be forced.	Price. £	s.	d.
2	300	12	0	0
3	600	15	0	0
4	1,000	18	0	0
5	1,500	21	0	0
6	2,000	25	0	0
7	3,000	30	0	0
8	5,000	35	0	0
9	7,000	40	0	0
10	10,000	48	0	0
11	15,000	58	0	0
12	20,000	70	0	0
13	35,000	100	0	0
14	50,000	140	0	0
15	70,000	210	0	0
16	100,000	250	0	0

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His Highness the Maharajah of Kashmir
His Grace the Duke of Cleveland
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The Most Noble the Marquis of Downshire
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TESTIMONIALS.

From Mr. A. J. Rutherford, Agent to C. F. H. Bolckow, Estate Office, Marton Hall, Middlesborough, 26th September, 1883.

"Dear Sir,—I am glad to say that the Rams you put down on the Hambleton Estate for Mr. C. F. H. Bolckow, are working very well. You undertook, with 16 gallons per minute, to send up 1500 gallons a day, and with enough water to work the Rams at full power, 2000 gallons a day. With a supply of 11¾ gallons per minute they are lifting 2200 gallons, and when working full power, 3105 gallons per day are sent up to a height of nearly 400 ft. They made a clear start, and have gone well since."

The Delivery Pipe, in the above case, is 9000 ft. in length.

From Mr. Henry Robinson, Engineer to the Stockport District Waterworks Company, September 8, 1883.

"Dear Sir,—I can now report well of the two Hydraulic Rams we have fixed to your instructions for the supply of Disley Village. 40,000 gallons per day was the quantity you promised they would force to a height of 63 ft., but on testing them I am convinced that 57,000 gallons is not the limit of their power, whilst the quantity of waste water used in driving them is not equal to half the capacity of the 6-in. pipe by which they are fed, and I am inclined to the belief that a more simple and efficient pump cannot be found."

From Horatio R. B. Peile, Esq., Commissioner to Sir Michael Shaw Stewart, Bart., Mansion House, Greenock, 13th August, 1883.

"I am glad to say the Ram you fixed at Castle Farm in November last for Sir Michael Robert Shaw Stewart, Bart., continues a great success. The smallness of the driving water—2¼ gallons per minute—is not more wonderful than the large proportion of water it sends up—viz., 720 gallons per day, through about 400 yards of delivery pipe, to an elevation of 75 ft.

From Messrs. Austin and Johnson, Architects, 3, Arcade, Pilgrim Street, Newcastle-on-Tyne, 20th September, 1883.

"The five Patent Hydraulic Rams—with about 2½ miles of Delivery Pipes—we employed you to fix on the Callaley Castle Estate, for Alexander Henry Browne, Esq., are so far very satisfactory, particularly when the small quantity of driving water, and the height and distance to which it is forced, are considered. The result is certainly all that you promised."

From Captain Townshend, Wincham, Feb. 10th, 1877.

"In answer to your enquiry, I am glad to say the Hydraulic Ram you sent me in November, 1875, is working exceeding well, and gives no trouble. It will work when quite immersed, as it has been several times during this winter, forcing up water through a delivery pipe 900 yards long at the rate of 80,000 gallons per day, although you only promised 50,000."

From J. Spender Clay, Esq., Ford Manor, Lingfield, Surrey, August 9th, 1880.

"In reply to your letter of enquiry, I am glad to be able to say that the two Hydraulic Rams which you fixed here are working satisfactorily, and that out of 13 gallons 3 quarts per minute, the maximum yield of the spring, they deliver to the top of my house, distant a full mile from the spring, 4 gallons 1 quart per minute, or 6120 gallons per 24 hours, being 120 gallons above the quantity you guaranteed."

From Mr. John Archbold, Engineer to Messrs. Barber, Walker, and Co., Eastwood, Notts, October 21st, 1882.

"I am glad to inform you that the Hydraulic Ram you fixed for Thomas Barber, Esq., whilst working with a fall of 30 ft., and forcing to a height of 90 ft., through 200 yards of delivery pipe, is working exceeding well, throwing up 9 pints out of every 35 pints passing through it, thus giving 77 per cent. of useful effect."

From Mr. T. Barham Foster, C.E., 23, John Dalton Street, Manchester, 12th October, 1883.

"Dear Sir,—I have tested the Ram you contracted to fix on the Hints Estate, Staffordshire, for James Chadwick, Esq., to force 10,000 gallons per day of spring water through 800 yards of delivery pipe, to an elevation of 208 ft., whilst worked by river water falling 5 ft. 9 in., and am pleased to find that when at full power the Ram sends up 13,500 gallons per day to the height and distance named, and though the ram is now adjusted to work at only three-fourths its power, the work done represents over 57 per cent. of useful effect."

From Fred J. Turner, Esq., Agent to His Grace the Duke of Portland, Mansfield Woodhouse, August 30th, 1883.

"Dear Sir,—I have much pleasure in stating that the Hydraulic Rams which you erected last year for His Grace the Duke of Portland, at Lyndhurst, near Mansfield, and at Skeldon, Ayrshire, are working very well, and they are most satisfactory in every way."

From Mr. E. W. Streeter, F.R.G.S., Diamond Merchant, Bond Street, London, and Sackville Park, Sussex, October 1st, 1883.

"Dear Sir,—When you surveyed the site at Sackville Place, Buxted, for the purpose of fixing a Ram with one mile of collecting and distributing mains, I was surprised and pleased when you named the quantity of water you could send up from the resources available.

"My bailiff prepared the ground to your instructions, and in 12 days from the arrival of your men, the Ram was in operation, sending up 20 per cent. more water than you promised to a height of 110 ft., and distributing a supply to a farm and several cottages on the way.

"I have pleasure in recording my entire approval of the work."

From J. R. Shaw, Esq., Arrowe Park, Cheshire, August 31st, 1883.

"I have much pleasure in testifying to the excellence of the two Rams you fixed here. One forces 7000 gallons per day of turbid water, and the other 4000 gallons per day of spring water, through more than 1000 yards of delivery pipe, to an elevation of 110 ft., and the working of the Rams is as satisfactory as the workmanship is creditable."

From Sir A. Woodiwiss, The Pastures, Derby, January 15th, 1883.

"Dear Sir,—In reply to your enquiry, I have much pleasure in informing you that the Hydraulic Ram you supplied and fixed for me in July last, is working as satisfactorily as could be wished, and has fully realised my expectations, and I have no hesitation in saying it is a decided success."

From Sir Robert Menzies, Bart., of Menzies, Rannoch Lodge, Rannoch, August 20th, 1880.

"The Hydraulic Ram which you fixed for me to supply water to Rannoch Lodge and Camesurich, two houses ¼ of a mile apart, is a complete success. The extreme distance the water is carried is 1¼ mile, and it is raised fully 100 ft., and though the elevations of the two houses are different, there is a regular supply of 7 quarts per minute to each house, which has never ceased since the Ram was set agoing about three months ago. Your Ram took the place of one previously tried on the same spot, and which did not succeed, and was in fact a complete failure."

From Mr. William Lait, Architect and County Surveyor, Compton Verney, Warwick, 16th January, 1882.

"I have much pleasure in stating that the Patent Hydraulic Ram I had from you for the Rev. J. Cardwell Gardner, of the Vicarage, Butler's Marston, and which you fixed there, is I consider remarkably successful, as indicated below.

"4120 gallons of water per day are passing through the Ram with a descent of 12 ft. 8 in. Out of this small quantity 1080 gallons are sent up to a height of 41 ft., showing 78 per cent. of useful effect, and the noise of its working is so slight as to be almost inaudible."

PRICES OF DOUBLE-ACTING RAMS OF FIGURE B MAKE TO FORCE TO MEDIUM HEIGHTS.

No. of the size of the Ram.	Number of Gallons per day of 24 hours, the Ram will raise where there is sufficient working fall as compared to the height the water has to be forced.	Price. £	s.	d.
2	300	30	0	0
3	500	40	0	0
4	1,000	50	0	0
5	2,000	60	0	0
6	4,000	90	0	0
7	7,000	120	0	0
8	10,000	150	0	0
9	15,000	180	0	0
10	20,000	200	0	0
11	30,000	250	0	0
12	50,000	400	0	0
13	70,000	500	0	0
14	100,000	600	0	0

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Quintin Hogg, Esq, Holly Hill, Southampton
Alexander Henry Browne, Esq., Callaley Castle, Alnwick
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We have over 900 stamps in successful work in the various Western Gold Districts.

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Of the most approved German pattern and arrangement, or with Stamps and Frue Vanner Concentrators for low grade silver ores, light in lead. We have over 20 large German pattern mills at work on lead, zinc, or copper ores, and numerous Vanner mills on ores never before successfully concentrated.

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We have 80 Water Jacket Smelting Furnaces in use from 20 in. circular up to 54 in. by 60 in. for lead and silver smelting; and special High Jacket Furnaces for copper ores.

Engines of any size, plain slide valve, Corliss, compound Corliss, Boilers, all sizes. **Leaching Mills, Hallidie Wire Rope Tramways. Comet Crusher,** with capacity of 12 to 20 tons per hour. **White, Howell. Bruckner, and Stetefeldt Roasting Furnaces, &c.**

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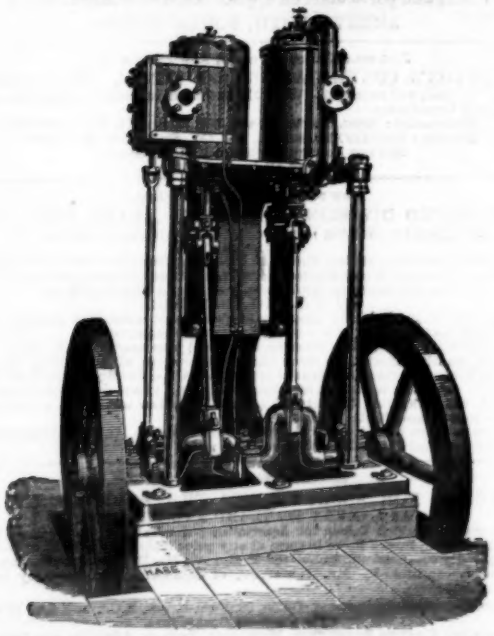
"Champion" Rock-borer
AND AIR COMPRESSOR.



As an instance of the actual work done by this Machinery in various kinds of ground, some of it the hardest rock, it may be mentioned that in Cornwall, irrespective of the work performed by the "Champion" Rock-borers and Air-compressors purchased by various Mines, the drivage, rising, sinking, and stoping done by contract by the Proprietor with his own Machinery now amounts to over 1150 fathoms.

Several of these Air-compressors, ranging from 3½ to 12 tons in weight may be seen in constant work in the Camborne Mining District.

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ENGINEER,
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New, slightly defective.

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10, 12, 14, 16, 18, 20, 24, 30, 40, 50, 60, 70, 75, 80 lb. per yard.
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WILLIAM FIRTH, WATER LANE, LEEDS.

POINTS and CROSSINGS with all Fittings complete.
2000 tons in stock ready for delivery.

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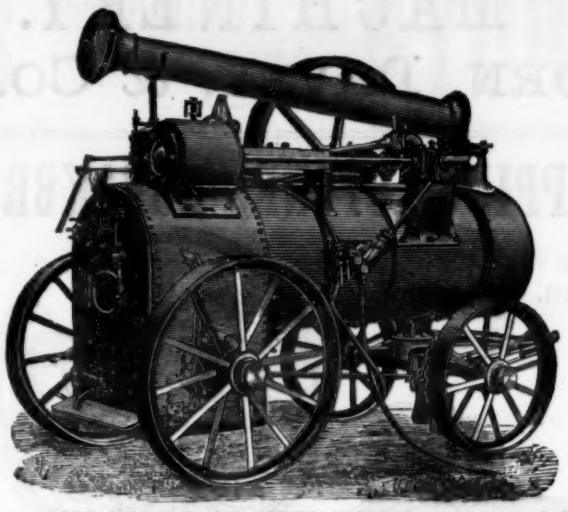

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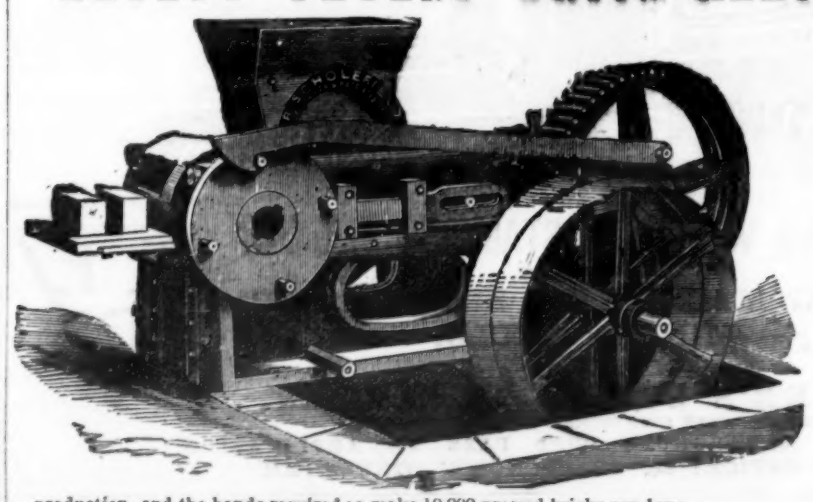

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1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 2s. per day	0 2 0
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